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ABSTRACT

This annotated film catalog is a product of the Conference on Single Concept Films in College Physics Teaching sponsored by the Commission on College Physics. Both 8mm and 16mm single concept films are listed for physics and related disciplines. The catalog includes commercial, noncommercial, and foreign films. However, the film coverage was limited to those lasting 10 minutes or less, with the exception of film cartridges for the Fairchild projector. The films are grouped into eleven areas: Mechanics; Thermodynamics; Electricity and Magnetism; Optics and Waves; Atomic and Nuclear; Fluid Mechanics; Astronomy; Chemistry; Mathematics; Lab, Apparatus, and Miscellaneous. The appendices include a list of film distributors and producers, a list of computer-animated films, and a list of leading university audio-visual libraries. (PR)

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COMMISSION ON COLLEGE PHYSICS

Short Films for Physics Teaching

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Short Films for Physics Teaching

A Catalog

published by

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The Commission on College Physics

The Commission on College Physics is a national organization established by the physics profession in 1960 to coordinate efforts to improve undergraduate physics instruction. The Commission's full-time professional staff consists of a Director and Staff Physicists who are typically academic physicists on leave for one- or two-year terms. Commission programs are guided and reviewed by the Commissioners, seventeen physicists elected from the physics profession or appointed by the Commission.

The Commission is engaged in the development of broad programs to identify and understand the problems of undergraduate physics teaching, to stimulate the search for solutions, to encourage innovation and experimentation, and to design mechanisms which will assure continued involvement of physicists in these tasks. The Commission offices are located in the Department of Physics and Astronomy at the University of Maryland. The activities of the Commission on College Physics are financed by a grant from the National Science Foundation.

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The collection, annotation, and preparation of entries for the catalog is the work of Barbara Z. Bluestone of the CCP staff. Richard F. Roth of the staff, provided the physicist's critical appraisal and rewriting of entries and prepared the computer program which produced the bibliography. We also acknowledge the dedicated work of our keypuncher, Patricia Arnold, whose perseverence allowed us to finish as quickly as we have.

The work on this catalog was reduced significantly by the ground work done at the University of Southern California's National Information Center for Educational Media. Their film catalog and automatic cataloguing process provided us with guidelines for card format and layout and with incontestable evidence that the task was not insurmountable.

Table of Contents

Acknowledgments iii

Introduction 1

Mechanics 5

Thermodynamics 15

Electricity and Magnetism 19

Optics and Waves 23

Atomic and Nuclear 29

Fluid Mechanics 35

Astronomy 41

Chemistry 43

Mathematics 49

Lab, Apparatus, and Miscellaneous 53

Appendix I: Series Descriptions 63

Appendix II: Distributors and Producers 69

Appendix III: List of Computer-Animated Films 75

Appendix IV: Leading University Audio-Visual Libraries 77

Addition and Correction Form 79

Film Evaluation Questionnaire 81

Index 83

Introduction

Rapid improvements in film technology and increasing experimentation with visual pedagogy have pushed this medium, particularly in the 8mm format, into a position of importance in teaching. New, easy loading projectors have eliminated the bother of threading the more cumbersome projectors of the past; new mass production techniques are making film more inexpensive; short, single concept films which treat one idea or one set of ideas in depth, are being produced which allow teachers to insert film into lectures, laboratories, examinations, and study sessions to augment their expositions rather than to replace or to repeat them; finally, easily handled cartridges and compact cartridge projectors open the possibilities of extensive film libraries for indepedent study and of new experimentation with self-study courses which make greater use of audio-visual technology. It was to look closely at the potential of short films and new projectors that the Commission on College Physics called its Conference on Single Concept Films in College Physics Teaching (November 15-17, 1966 in Troy, New York). More than fifty physicists, film makers, manufacturers' representatives. and others gathered to discuss and elaborate on the uses to which the physics profession might put the single concept film and to examine the possibilities for the physicist-film maker interested in producing his own films for classroom use. The report of this Conference, which includes much technical information as well as suggestions for experimentation in film use and film making, is available on request from the CCP office.

If films are to become more important in physics instruction they must be known and used. Since the Commission had assembled an impressive collection of films for the Conference, it was suggested that part of the Conference Report take the form of an annotated catalog of short films in physics and related disciplines.

In compiling this catalog we have had to make several arbitrary definitions. We have, with one exception, limited its scope to films less than ten minutes in length. The exception is the list of films which are available in cartridge form for projection in the Fairchild projector. We have made no evaluation of the films and include many films designed for high school use or films whose main audience will be in the other sciences. We have also made a determined effort to make the catalog as complete as possible and have included as many foreign films as we could discover, some of which may not be easily available in the United States. The catalog also includes films produced by individual physicists which are not distributed commercially.

We recognize that the existence of an uncritical listing of films is only a necessary first step toward their use and we see this catalog as only a beginning effort. Two further steps will be needed: evaluation of the films in actual instructional use and periodic revision and updating of the catalog. In cooperation with the Visual Aids Committee of the AAPT we will work toward providing at least a consensus evaluation of as many films as possible and include at the back of this catalog an evaluation form to begin this collection.

In order to facilitate periodic revision we have produced this catalog by computer print-out and thus maintain the information it contains in a form which lends itself to easy rearrangement. We expect additions and corrections to the present material as well as the increased production of new films to force us into early re-edition, and request the assistance of the profession in the collection of this information (see form, page ...).

Our guiding principle throughout the compilation of the information presented here* has come from the question, "What does the teaching physicist want to know about these films?" A measure of the catalog's success will be the extent to which it leads to more use of the films it describes.

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* See the following page for explanation of the coding we have used in the film descriptions.

Codes for Film Descriptions

Below are explanations of the coded information which appears below each abstract in the catalog. Producer and distributor codes are explained in Appendix I; series codes in Appendix II. Dates refer to years in which films were produced. Running time of films are rounded off to the nearest minute.

8	**Regular 8 format**
8S	**Super 8 format**
16	**16mm format**
TC	**Technicolor silent Magi-Cartridge**
FC	**Fairchild sound MoviePak Cartridge**
RE	**Reel**
COLOR	**Color film**
BW	**Black and white film**
SOUND	**Sound film**
SILENT	**Silent 16mm film**

Mechanics

ACCELERATION

NO INFORMATION AVAILABLE.
PROD-ECTHEN 8 COLOR
DIST- TC TN 1967

ACCELERATION DUE TO GRAVITY--METHOD I 4 MIN

A BOWLING BALL IN FREE FALL IS FILMED IN SLOW MOTION. STUDENT TIMES PASSING BALL AT 0, 1/2, 3/2 AND 2 METERS FINDING AVERAGE SPEED OVER FIRST AND SECOND INTERVALS AND DETERMINING TIME MIDPOINTS FOR EACH. THEN G CAN BE CALCULATED.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-M
DIST-EBF TC,RE TN,SN 1967

ACCELERATION DUE TO GRAVITY--METHOD II 4 MIN

A BOWLING BALL DROPS 4 METERS IN SLOW MOTION. STUDENT CAN MEASURE AVERAGE SPEED OF BALL OVER 20 CM INTERVALS AND CALCULATE G.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

ACCELERATION VECTOR, THE 4 MIN

COMPUTER ANIMATED. VELOCITY VECTOR IS SHOWN FOR A SPOT MOVING IN AN IRREGULAR BUT REPEATED PATH. ACCELERATION IS INTRODUCED BY SHOWING THAT HEAD OF VELOCITY VECTOR MOVES IN A COMPARABLE BUT DIFFERENT PATH. COMPUTER THEN DETERMINES SPEED AND DIRECTION OF HEAD OF VELOCITY VECTOR AND DISPLAYS THIS ALSO AS ARROW--THE ACCELERATION OF THE ORIGINAL SPOT.
COLLABORATOR--FRANCIS FRIEDMAN
PROD-EDC 8,16 BW SERIES-VK
DIST-SET F TC,RE TN 1964

ANGULAR MOMENTUM--A VECTOR QUANTITY 27MIN

DEMONSTRATIONS SHOW THAT ANGULAR MOMENTA ADD VECTORIALLY. PHENOMENON OF PRECESSION USED TO INDICATE THE PRESENCE OF ANGULAR MOMENTUM - ANGULAR MOMENTA OF THREE WHEELS ARE ADDED SO THAT NO PRECESSION EXISTS. DEMONSTRATES THE EFFECT OF A TORQUE ON A SPINNING WHEEL.
COLLABORATOR--AARON LEMONICK
PROD-EDC 8 BW SERIES-CPF
DIST-EDC FC TN 1962

AVERAGE SPEED 4 MIN

SHOWS VARIOUS NON-UNIFORM MOTIONS OVER A STRAIGHT PATH 50 FEET LONG. STUDENTS CAN OBTAIN AVERAGE SPEEDS.
PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1964

CENTER-OF-MASS PENDULUM 5 MIN

A DOUBLE PENDULUM IS HUNG BY RODS FROM THE CENTER OF A LINEAR AIR TRACK GLIDER SUCH THAT ITS MASS EQUALS THE MASS OF THE GLIDER. WHEN A TARGET DISC IS POSITIONED AT THE CENTER OF MASS OF THE DEVICE, IT MOVES UNIFORMLY ALONG THE TRACK, EVEN WHILE GLIDER AND PENDULUM ARE OSCILLATING. DEMONSTRATES TYPES OF COLLISIONS AND SHOWS EFFECT OF ALTERING GLIDER'S MASS.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

COLLIDING FREIGHT CARS 4 MIN

THE HAMMER CAR WEIGHS 210,000 LBS., THE TARGET CAR 260,000 LBS. IMPACT SPEED IS 8 MPH. A FORCE OF 1,250,000 LBS. CAN BE ACHIEVED. STUDENTS TAKE MEASUREMENTS FROM FILM.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

COLLISIONS WITH AN UNKNOWN OBJECT 4 MIN

IN SUCCESSIVE SEQUENCES A STEEL BALL OF UNKNOWN MASS IMPINGES FIRST ON A 350 GM BALL THEN ON A 4.26 KG BALL. THE INITIAL SPEED OF THE UNKNOWN MASS IS THE SAME IN BOTH SEQUENCES. THE FINAL SPEEDS OF THE TWO KNOWN MASSES CAN BE MEASURED AND, ASSUMING ELASTIC COLLISIONS, THE UNKNOWN MASS CAN BE CALCULATED.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

CONCEPT OF SPEED I, THE 3 MIN

PRESENTS UNIFORM MOTION ALONG A STRAIGHT LINE WITH INCREASING ABSTRACTION--A RIDER ON A HORSE, A WHEEL ROLLING ON A LEVEL SURFACE, A POINT IN UNIFORM MOTION. STUDENT WORKBOOK AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1965

CONCEPT OF SPEED II, THE 3 MIN

SEQUEL TO CONCEPT OF SPEED I. STUDENTS TIME THE MOTION, MEASURE DISTANCES, AND CALCULATE SPEEDS.
PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1965

CONSERVATION OF ENERGY 3 MIN

A LINEAR AIR TRACK GLIDER IS GIVEN KINETIC ENERGY IN THREE WAYS--WORK DONE BY A CONSTANT FORCE DEVICE, GRAVITATIONAL POTENTIAL ENERGY OR AN INCLINED TRACK AND ELASTIC POTENTIAL ENERGY OF A COMPRESSED SPRING. IN EACH CASE THE GLIDER'S FINAL VELOCITY IS CALCULATED FROM A RECORDER TRACE.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

CONSERVATION OF LINEAR AND ANGULAR MOMENTUM 4 MIN

THE MOTION OF THE CENTER OF MASS OF TWO DRY ICE PUCKS IS RECORDED ON SPARK PAPER. A SMALL BALL STRIKES THE PUCK SYSTEM AT CONSECUTIVELY DIFFERENT POSITIONS AND DIRECTIONS. IN EACH CASE, THE CENTER OF MASS FOLLOWS A PATH PARALLEL TO THE VELOCITY VECTOR OF THE BALL AND THE FINAL ANGULAR MOMENTUM IS THE PRODUCT OF THE MOMENT OF INERTIA AND THE ANGULAR VELOCITY OF THE SYSTEM.
COLLABORATOR--H. F. MEINERS
PROD-EFL 8,8S,16 COLOR
DIST-EFL TC,RE TN 1966

CONSERVATION OF MOMENTUM--ELASTIC COLLISIONS 4 MIN

CONTRASTS ELASTIC AND INELASTIC COLLISIONS AND THEN INTRODUCES EXAMPLES AS PROBLEMS. FINALLY A ''PROJECTILE'' GLIDER ON A LINEAR AIR TRACK IS PROJECTED AT A STATIONARY GLIDER AND THEIR RESPECTIVE DISTANCES FROM THE IMPACT POINT ARE MEASURED.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

CONSERVATION OF MOMENTUM--INELASTIC COLLISIONS 4 MIN

INELASTIC COLLISIONS (BETWEEN LINEAR AIR TRACK GLIDERS WHICH STICK TOGETHER) ARE CONTRASTED WITH ELASTIC COLLISIONS (BETWEEN GLIDERS WITH SPRING BUMPERS). A ''PROJECTILE'' GLIDER IS PROJECTED AT A STATIONARY ''TARGET'' GLIDER. THE TIME THE PROJECTED GLIDER TAKES TO TRAVEL A GIVEN DISTANCE AND THE TIME BOTH GLIDERS TAKE TO TRAVEL EQUAL DISTANCES AFTER IMPACT ARE RECORDED.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

CONSTANT VELOCITY AND UNIFORM ACCELERATION 4 MIN

A LINEAR AIR TRACK GLIDER'S PASSAGE ALONG THE TRACK IS DETECTED BY PHOTOCELLS AND RECORDED ON A TIME-TRACE. PEAK-SEPARATIONS MEASURE THE TIME TAKEN TO PASS BETWEEN ADJACENT PHOTOCELLS. PEAK-WIDTHS YIELD APPROXIMATE VALUES FOR THE GLIDER'S ''INSTANTANEOUS VELOCITY.'' SHOWS CONSTANT VELOCITY ALONG A LEVEL TRACK AND UNIFORM ACCELERATION DOWN A TRACK AT THREE DIFFERENT INCLINATIONS.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

COUPLED OSCILLATORS--EQUAL MASSES 4 MIN

MEASUREMENT OF CLAMPED FREQUENCIES AND FREQUENCIES OF THE TWO NORMAL MODES FOR A PAIR OF SPRING-COUPLED CARTS - MIXED MODES.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

COUPLED OSCILLATORS--UNEQUAL MASSES 4 MIN

MEASUREMENT OF CLAMPED FREQUENCIES AND FREQUENCIES OF TWO NORMAL MODES - EXISTENCE OF TWO RESONANT FREQUENCIES - MIXED MODES.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

DAMPED OSCILLATIONS

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

DISPLACEMENT 3 MIN

SHOWS DISPLACEMENT OF AN INDIVIDUAL AND THE MARKING OF HIS SUCCESSIVE POSITIONS IN POLAR COORDINATES.
PROD-NFBC 8,8S,16 COLOR
DIST-EBF TC,RE TN 1965

ENERGY AND ITS TRANSFORMATION 10MIN

POTENTIAL, KINETIC AND RADIANT ENERGY AS MANIFESTED IN MECHANICAL, CHEMICAL AND THERMAL FORMS ARE ILLUSTRATED AND EXPLAINED. EXPERIMENTS DEMONSTRATE POWER, WORK AND CONSERVATION OF ENERGY.
PROD-EBF 16 BW
DIST-EBF RE SOUND

ENERGY AND THE PENDULUM 2 MIN

AS A PENDULUM SWINGS, THE SUM OF THE POTENTIAL ENERGY (MEASURED WITH RESPECT TO THE LOWEST POINT OF THE SWING) AND THE KINETIC ENERGY IS VERY NEARLY CONSTANT.
COLLABORATORS--B. K. HARRIS AND G. R. NOAKES
PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

ENERGY CONVERSION I--POLE VAULTER 4 MIN

QUALITATIVE (OR POSSIBLY SEMI-QUANTITATIVE) DISCUSSION LOOP. A SLOW-MOTION RECORD OF THE APPROACH AND THE JUMP, USING A FIBERGLASS POLE. STUDENT DETERMINES WHERE THE SUPPLY OF ENERGY IS AT ANY ONE TIME.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

ENERGY CONVERSION II--AIRCRAFT TAKE OFF 2 MIN

STUDENT MEASURES AIRCRAFT'S SPEED BEFORE AND AFTER TAKE OFF WHICH IS DONE AT CONSTANT POWER.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

ENERGY TRANSFER 4 MIN

TWO LONG, COUPLED PENDULA ARE STARTED IN SYNCHRONIZATION AND OSCILLATE AT UNIFORM AMPLITUDE. ONE PENDULUM IS THEN STARTED WHILE THE OTHER IS AT REST - ENERGY IS TRANSFERRED FROM ONE TO THE OTHER AND BACK AGAIN. EFFECT OF ALTERING COUPLING IS SHOWN. FINALLY COUPLED SAND PENDULA LEAVE TRACES ON A MOVING TABLE AND PROVIDE PLOT OF AMPLITUDE VARIATION WITH TIME.
COLLABORATOR--ALAN HOLDEN
PROD-EDC 8,8S,16 COLOR SERIES-CC
DIST-SET F TC,RE TN 1964

EXPERIMENTAL WEIGHTLESSNESS 3 MIN

ANIMATED. SHOWS FLIGHT PATH OF PLANE USED IN WEIGHTLESSNESS EXPERIMENTS. IN LIVE ACTION, PERSONS UNDER WEIGHTLESS CONDITIONS ARE SHOWN.
PROD-FAC 8 COLOR SERIES-SS
DIST-FAC TC TN 1964

EXPERIMENT ON THE CONSERVATION OF MOMENTUM, AN 9 MIN

WOODEN CYLINDERS HANGING FROM BIFILAR SUSPENSIONS FLY APART WITH EQUAL SPEEDS WHEN A COMPRESSED SPRING BETWEEN THEM IS RELEASED. EXPERIMENT IS REPEATED WITH ONE HEAVY METAL CYLINDER AND ONE WOODEN ONE. RATIO OF SPEEDS SHOWN TO BE PROPORTIONAL TO MASSES.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

EXPLOSION OF A CLUSTER OF OBJECTS 2 MIN

A POWDER CHARGE EXPLODES IN THE CENTER OF A CLUSTER OF 5 STEEL BALLS (MASSES GIVEN) INITIALLY AT REST. AFTER THE EXPLOSION, 4 BALLS CAN BE TRACED AND THEIR SPEED MEASURED. THE FIFTH IS NOT IMMEDIATELY VISIBLE AND CANNOT BE MEASURED. ASSUMING THE MOMENTUM OF THE CLUSTER TO BE ZERO, STUDENT CAN FIND THE DIRECTION THE INVISIBLE BALL SHOULD TAKE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

FALLING BODIES 4 MIN

TWO BALL BEARINGS ARE RELEASED SIMULTANEOUSLY FROM THE EDGE OF A HORIZONTAL TABLE. ONE FALLS STRAIGHT DOWN, THE OTHER HAS AN INITIAL HORIZONTAL VELOCITY. SLOW MOTION SHOWS THAT THE BALLS STRIKE THE GROUND TOGETHER. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

FINDING THE SPEED OF A RIFLE BULLET--METHOD I 4 MIN

A RIFLE DISCHARGES A BULLET INTO A LOG WHICH ACTS AS A PENDULUM. STUDENT MEASURES SPEED OF LOG AFTER IMPACT - BOTH LOG AND BULLET ARE WEIGHED. MUZZLE SPEED IS 2700 FT/SEC. STUDENT FINDS THE ENERGY OF THE BULLET BEFORE IMPACT AND OF THE SYSTEM AFTER IMPACT.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

FINDING THE SPEED OF A RIFLE BULLET--METHOD II 4 MIN

A RIFLE DISCHARGES A BULLET INTO A LOG WHICH IS A BALLISTIC PENDULUM. MASSES OF BULLET AND LOG ARE GIVEN AND VERTICAL RISE OF LOG CAN BE MEASURED. SPEED OF LOG AFTER IMPACT CAN BE CALCULATED. STUDENT FINDS THE ENERGY OF THE BULLET AND OF THE SYSTEM AFTER IMPACT.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

FIXED SYSTEM OF ORBITING BODIES 4 MIN

COMPUTER ANIMATED. SHOWS THE BEHAVIOR OF TWO UNEQUAL MASSES MOVING UNDER A ONE OVER R SQUARED FORCE. VARIOUS INITIAL CONDITIONS ARE SHOWN. EXCERPT FROM ''FORCE, MASS, AND MOTION.''
COLLABORATOR--FRANK SINDEN
PROD-EDC 8 BW SERIES-CB
DIST-SET F TC TN 1967

FORCE, MASS AND ACCELERATION 4 MIN

THE SAME FORCE IS APPLIED TO TROLLEYS A AND B. SINCE ACCELERATIONS ARE THE SAME, MASSES ARE EQUAL. WHEN A AND B ARE COUPLED, THEY FORM A TROLLEY OF DOUBLE MASS. SAME FORCE APPLIED - ACCELERATION IS HALF THAT FOR A SINGLE TROLLEY. IF CONSTANT FORCE IS APPLIED, INERTIAL MASSES CAN BE COMPARED.
COLLABORATORS--B. K. HARRIS AND G. R. NOAKES
PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

FORCE, MASS, AND MOTION 10MIN

COMPUTER ANIMATED. DEMONSTRATES THE EFFECT OF VARIOUS FORCES ON THE MOTION OF BODIES. THEN SHOWS THE BEHAVIOR OF TWO BODIES UNDER 1/R, 1/R SQUARED, AND 1/R CUBED FORCES FOR VARIOUS INITIAL VELOCITY CONDITIONS.
PROD-SINDEN 16 BW
DIST-LABTV RE SILENT 1966

FORCES 8 MIN

QUALITATIVE DEMONSTRATION OF A SIMPLE CAVENDISH EXPERIMENT AND A COMPARISION OF THE RELATIVE BEHAVIOR OF GRAVITATIONAL AND ELECTRIC FORCES. EXCERPT FROM LONGER FILM OF THE SAME TITLE.
PROD-EDC 16 BW SERIES-PSSC
DIST-EDC RE SOUND

FRAMES OF REFERENCE, PART I 7 MIN

GRAVITY IN DIFFERENT FRAMES OF REFERENCE. EXCERPT FROM LONGER FILM OF THE SAME TITLE.
COLLABORATORS--PATTERSON HUME AND DONALD IVEY
PROD-EDC 16 BW SERIES-PSSC
DIST-EDC RE SOUND

FRAMES OF REFERENCE, PART II 6 MIN

DEMONSTRATES THE BEHAVIOR OF A FRICTIONLESS PUCK IN A ROTATING FRAME OF REFERENCE. EXCERPT FROM LONGER FILM OF THE SAME TITLE.
COLLABORATORS--PATTERSON HUME AND DONALD IVEY
PROD-EDC 16 BW SERIES-PSSC
DIST-EDC RE SOUND

FREE FALL 4 MIN

A BOWLING BALL DROPS FOUR METERS IN SLOW MOTION. STUDENT CAN MEASURE AVERAGE SPEED OF BALL OVER 20 CM INTERVALS AT THE 1, 2, 3, AND 4 METER MARKS. USING V SQUARED EQUALS 2 GH, GOOD VALUES FOR G CAN BE CALCULATED.
PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1964

FREE FALL FROM AN AIRCRAFT 4 MIN

AN OBJECT IS DROPPED FROM AN AIRPLANE. STUDENT PLOTS PARABOLIC TRAJECTORIES.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-M
DIST-EBF TC,RE TN 1967

FREE FALL IN SPACE 4 MIN

ANIMATED. EXPLAINS WHY A SATELLITE REMAINS IN ORBIT. IN LIVE ACTION SHOWS AN ASTRONAUT IN AN ORBITING SATELLITE.
PROD-FAC 8 COLOR SERIES-SS
DIST-FAC TC TN 1964

FURTHER EXAMPLES OF ONE-DIMENSIONAL COLLISIONS 4 MIN

CONTAINS TWO FURTHER ONE-DIMENSIONAL COLLISIONS INVOLVING STEEL BALLS (1.80 KG AND 532 GM), BOTH IN MOTION IN OPPOSITE DIRECTIONS - AND THEN BOTH IN MOTION IN THE SAME DIRECTION. SEVEN STROBOSCOPIC PHOTOGRAPHS OF THE COLLISIONS WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

FURTHER EXAMPLES OF TWO-DIMENSIONAL COLLISIONS 4 MIN

A PROBLEM LOOP SUPPLEMENTARY TO TWO-DIMENSIONAL COLLISIONS. STEEL BALLS (539 GM AND 367 GM) COLLIDE, FIRST WITH ONE AT REST, THEN WITH BOTH IN MOTION. SEVEN STROBOSCOPIC PHOTOGRAPHS OF COLLISIONS WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

GALILEAN RELATIVITY I 4 MIN

QUALITATIVE. GALILEO'S EXPERIMENT--AN OBJECT IS DROPPED FROM THE MAST OF A SHIP - IS REPEATED, MODERN FASHION.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-M
DIST-EBF TC,RE TN 1967

GALILEAN RELATIVITY II 2 MIN

QUALITATIVE. AN OBJECT IS FIRED FROM A SLEIGH WHICH IS A) AT REST - B) MOVING AT CONSTANT SPEED - C) ACCELERATING - D) DECELERATING.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-M
DIST-EBF TC,RE TN 1967

GALILEAN RELATIVITY DEMONSTRATED BY PROJECTILE MOTION 4 MIN

BALL IS PROJECTED VERTICALLY UPWARD FROM CART MOVING WITH CONSTANT VELOCITY. DEMONSTRATES THAT THE MOTION OF THE BALL WITH RESPECT TO THE CART IS THE SAME AS THE MOTION FROM A STATIONARY CART WITH RESPECT TO THAT CART.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

GALILEO'S LAWS OF FALLING BODIES 6 MIN

RECREATES EXPERIMENTS WITH THE INCLINED PLANE AND FREELY FALLING BODIES BOTH IN THE ATMOSPHERE AND IN VACUUM.
COLLABORATOR--O. W. ESHBACH
PROD-EBF 16 BW
DIST-EBF RE SOUND

GRAVITATIONAL POTENTIAL ENERGY 4 MIN

FALLING WEIGHTS DRIVE NAIL. SHOWS THAT GRAVITATIONAL POTENTIAL ENERGY IS PROPORTIONAL TO MASS AND HEIGHT NEAR THE EARTH'S SURFACE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

GROWTH OF SOAP BUBBLES 4 MIN

THE EXCESS PRESSURE INSIDE A SOAP BUBBLE IS INVERSELY PROPORTIONAL TO ITS RADIUS OF CURVATURE. THUS WHEN TWO SOAP BUBBLES OF DIFFERENT SIZE ARE CONNECTED, THE LARGER GROWS AT THE EXPENSE OF THE SMALLER.

PROD-RMCS	8	COLOR
DIST-RMCS	TC	TN

GUINEA AND FEATHER EXPERIMENT, THE 4 MIN

SHOWS THAT IN A VACUUM TUBE, COIN AND FEATHER FALL AT THE SAME RATE - IN AN AIR-FILLED TUBE, COIN FALLS FASTER.

PROD-PURDUE	16	BW	
DIST-PURDUE	RE	SOUND	1960

GYROSCOPE PRECESSION 4 MIN

SHOWS THE PRECESSION OF A GYROSCOPE WHICH OCCURS WHEN A COUPLE IS APPLIED TO THE SPIN AXIS OF A GYROSCOPE.

PROD-RMCS	8	COLOR
DIST-RMCS	TC	TN

HIGH HURDLE I 4 MIN

A RACE IS FILMED IN SLOW MOTION AND STUDENT CALCULATES SPEEDS AT VARIOUS POINTS OF THE RACE.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-M
DIST-EBF	TC,RE	TN,SN	1966

HIGH HURDLE II 4 MIN

CONTINUATION OF PART I.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-M
DIST-EBF	TC,RE	TN,SN	1967

HOW AN AIR TRACK WORKS 5 MIN

SHOWS THE OPERATING PRINCIPLES OF THE AIR TRACK AND EXPLAINS THE EXPERIMENTAL PROCEDURES USED IN THIS SERIES.
COLLABORATOR--JOHN STULL

PROD-EFL	8,8S,16	COLOR	SERIES-LAT
DIST-EFL	TC,RE	TN	1966

INDEPENDENCE OF HORIZONTAL AND VERTICAL MOTIONS 3 MIN

METAL BALL SHOT HORIZONTALLY AND ONE RELEASED VERTICALLY FROM SAME HEIGHT AT THE SAME TIME STRIKE THE FLOOR SIMULTANEOUSLY. SLOW MOTION AND STOP MOTION WITH A SERIES OF HORIZONTAL REFERENCE LINES ILLUSTRATE PARABOLIC PATH OF FIRST BALL.

PROD-PURDUE	16	BW	
DIST-PURDUE	RE	SOUND	1960

INERTIAL FORCES--CENTRIPETAL ACCELERATION 3 MIN

THE ''ROTOR RIDE'' IN AN AMUSEMENT PARK. RIDERS HELD PRESSED AGAINST A ROTATING VERTICAL WALL, VIEWED FROM A STATIONARY FRAME OF REFERENCE AND ALSO FROM WITHIN THE ROTOR.

PROD-MILLER	8,8S,16	COLOR	SERIES-DP
DIST-EFL	TC,RE	TN	1963

INERTIAL FORCES--TRANSLATIONAL ACCELERATION 2 MIN

STUDENT EXPERIENCES G-FORCES WHILE STANDING ON SPRING BALANCE IN AN ELEVATOR. UPWARD ACCELERATION - DOWNWARD ACCELERATION - CONSTANT VELOCITY.

PROD-MILLER	8,8S,16	COLOR	SERIES-DP
DIST-EFL	TC,RE	TN	1963

INSTANTANEOUS SPEED I 4 MIN

DEFINITION OF AVERAGE SPEED AND ITS MEASUREMENT IN THE CASE OF A WHEEL MOVING ON AN INCLINED PLANE. INSTANTANEOUS SPEED.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1965

INSTANTANEOUS SPEED II 3 MIN

A WHEEL IS SHOWN SEVERAL TIMES AS IT ROLLS DOWN AN INCLINED PLANE, EACH TIME FROM THE SAME STARTING POINT WITH THE SAME SPEED. SHOWS MOTION OF THE WHEEL OVER A SET OF DISTANCES WHICH START AT THIS SAME POINT, BUT WHICH ARE INCREASINGLY SHORTER. STUDENTS MEASURE THE DURATIONS, ARE GIVEN THE DISTANCES, AND CAN CALCULATE AVERAGE SPEEDS.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1965

INSTANTANEOUS SPEED III 4 MIN

A SEQUEL TO INSTANTANEOUS SPEED II. A CAR SLOWS DOWN FROM 30 MPH - STUDENT CAN OBTAIN ITS INITIAL SPEED.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1965

KINETIC ENERGY OF MOTION 4 MIN

OBJECTS MOVING AT DIFFERENT SPEEDS DRIVE A NAIL SIDEWAYS TO SHOW THAT KINETIC ENERGY IS PROPORTIONAL TO THE SQUARE OF THE SPEED.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-E
DIST-EBF	TC,RE	TN,SN	1967

LAWS OF CONSERVATION OF ENERGY AND MATTER 8 MIN

EXPERIMENTS ILLUSTRATE THE PRINCIPLE THAT MATTER AND ENERGY MAY NOT BE CREATED OR DESTROYED, BUT, AS EXPLAINED BY EINSTEIN'S EQUATION, THEY CAN BE CONVERTED INTO ONE ANOTHER.
COLLABORATOR--MARVIN CAMRAS

PROD-CORF	16	C,BW
DIST-CORF	RE	SOUND

LAWS OF SLIDING FRICTION 6 MIN

MEASURING THE FORCES REQUIRED TO START AND TO MAINTAIN MOTION OF A BLOCK ON UNIFORM SURFACE SHOWS THAT THE FORCE OF STATIC FRICTION EXCEEDS THAT OF KINETIC FRICTION.

PROD-PURDUE	16	BW	
DIST-PURDUE	RE	SOUND	1960

LINEAR UNIFORM MOTION 4 MIN

USING A LABORATORY ICE-PUCK (WHICH MOVES ON A CUSHION OF GAS) AND A STROBOSCOPE, NEWTON'S FIRST LAW OF MOTION IS VERIFIED. THE FIRST HALF SHOWS THE EXPERIMENTAL SET-UP. THEN STROBOSCOPIC PHOTO IS ANALYZED USING ANIMATION, AND THE GRAPH OF DISTANCE AND SPEED VERSUS TIME IS DERIVED.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1964

MATTER OF RELATIVE MOTION, A 4 MIN

TWO SIMPLE CARTS OF EQUAL MASS COLLIDE BY SPRING BUMPERS. ONE CART IS INITIALLY AT REST, THE OTHER FINALLY AT REST. COLLISION VIEWED BY A CAMERA AT REST, AT THE SAME SPEED AS THE INITIAL CAR, AND AT HALF THAT SPEED. ILLUSTRATES GALILEAN INERTIAL FRAMES OF REFERENCE.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-M
DIST-EBF	TC,RE	TN	1967

MEASUREMENT OF G--CAVENDISH EXPERIMENT 4 MIN

TIME-LAPSE PHOTOGRAPH OF DAMPED TORSIONAL OSCILLATION OF MOVING SYSTEM AFTER EXTERNAL MASSES ARE SHIFTED.

PROD-MILLER	8,8S,16	COLOR	SERIES-DP
DIST-EFL	TC,RE	TN	1963

MEASUREMENT OF THE ACCELERATION OF GRAVITY-- FALLING BODY, A 8 MIN

OBJECT RELEASED FROM REST FALLS FREELY THROUGH A KNOWN VERTICAL DISTANCE. TIME IS MEASURED BY TWO PHOTOCELLS. THE POSITION OF THE LOW OF WHICH IS CHANGED IN SUCCESSIVE TESTS. DATA IS USED TO CALCULATE G.

PROD-PURDUE 16 COLOR
DIST-PURDUE RE SOUND 1960

MEASUREMENT OF THE SPEED OF A RIFLE BULLET, A 5 MIN

A BULLET FIRED THROUGH TWO DISCS MOUNTED AT OPPOSITE ENDS OF A MOTOR-DRIVEN SHAFT MAKES A HOLE IN THE SECOND WHICH IS SEPARATED FROM THE FIRST BY A MEASURABLE ROTATION ANGLE. SPEED OF BULLET IS CALCULATED FROM SEPARATION OF DISCS, SHAFT ROTATION SPEED, AND ROTATION ANGLE.

PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

MEASUREMENT OF TIME I 3 MIN

MEASUREMENT OF TIME USING AN HOUR GLASS, A PENDULUM, A CHRONOMETER. COMPARISON OF THREE INSTRUMENTS.

PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1964

MEASUREMENT OF TIME II 4 MIN

OSCILLATION OF A PENDULUM. THE PERIODIC SWING OF THE PENDULUM IS USED AS A UNIT OF TIME IN MEASURING THE TIME TAKEN BY AN OBJECT TO MOVE BETWEEN TWO POINTS.

PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1964

MEASUREMENT OF TIME III, THE 4 MIN

SHOWS FALLING BALL TIMING ITS OWN FALL BY BREAKING WIRES, WHICH SWITCH A COUNTER OFF. STUDENT MEASURES THE VELOCITY OF THE BALL AND COMPARES HIS READING TO THE ONE GIVEN BY THE ELECTRIC SWITCH. ALSO SHOWS HIGH SPEED STROBOSCOPIC EQUIPMENT FOR TESTING RIFLE BULLET SPEEDS.

PROD-NFBC 8,8S,16 COLOR SERIES-KINE
DIST-EBF TC,RE TN 1964

MEASUREMENT OF VERY HIGH SPEEDS 4 MIN

MEASUREMENT OF THE SPEED OF A PROJECTILE WITH THE HELP OF AN ELECTRONIC APPARATUS. ACTUAL SHOTS OF THE APPARATUS AND ANIMATED DIAGRAMS SHOWING THE PRINCIPLE OF THE METHOD.

PROD-NFBC 8,8S,16 COLOR
DIST-EBF TC,RE TN 1965

MILLION TO ONE, A 5 MIN

USES A DRY ICE PUCK AND A TRAINED FLEA TO SHOW THAT IN THE ABSENCE OF FRICTION A VERY SMALL FORCE WILL CAUSE A LARGE MASS TO ACCELERATE.

PROD-EDC 8 BW SERIES-PSSC
DIST-EDC FC TN

MOMENTUM AND THE PENDULUM 3 MIN

MASSES OF AN AIR RIFLE BULLET AND A PENDULUM BLOCK ARE FOUND BY WEIGHING. RIFLE IS LOADED AND PELLET FIRED INTO THE BLOCK WHICH RISES TO A VERTICAL HEIGHT H WHERE IT IS CAUGHT AND HELD AGAINST A SCALE. MUZZLE VELOCITY OF THE BULLET CAN BE DETERMINED.
COLLABORATORS--B.K. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

MOMENTUM OF ELECTRONS 10MIN

DEMONSTRATES AN EXPERIMENT IN WHICH A BEAM OF ELECTRONS PUSHES ON A VANE OF A TORSION PENDULUM WHICH IS ENCLOSED IN VACUUM TUBE. ELECTRON BEAM IS PULSED AT THE NATURAL FREQUENCY OF THE PENDULUM WHICH GRADUALLY INCREASES THE AMPLITUDE OF PENDULUM OSCILLATION.
COLLABORATOR--JOHN KING

PROD-EDC 16 COLOR SERIES-CPF
DIST-SET B RE SOUND 1963

MOTION AT RIGHT ANGLES 5 MIN

USING THE ATKINSON VECTOR TROLLEY, DEMONSTRATES THAT THE VECTOR SUM OF TWO VELOCITIES OR TWO ACCELERATIONS AT RIGHT ANGLES CAN BE DETERMINED USING SIMPLE GEOMETRIC PRINCIPLES.
COLLABORATORS--B. K. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

MOTION IN A CIRCLE, PART I 5 MIN

SHOWS THE MAGNITUDE AND DIRECTION OF THE ACCELERATION OF AN OBJECT ROTATING WITH CONSTANT SPEED IN A HORIZONTAL CIRCULAR ORBIT.
COLLABORATORS--B. K. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

MOTION IN A CIRCLE, PART II 3 MIN

CONTINUATION OF PART I
COLLABORATORS--B. K. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-MECH
DIST-FAC TC TN 1964

MOVING SYSTEM OF ORBITING BODIES 3 MIN

COMPUTER ANIMATED. SHOWS BEHAVIOR OF TWO UNEQUAL MASSES MOVING UNDER A ONE OVER R SQUARED FORCE. MOTION IS OBSERVED FROM TWO FRAMES OF REFERENCE. EXCERPT FROM ''FORCE, MASS, AND MOTION.''
COLLABORATOR--FRANK SINDEN

PROD-EDC 8 BW SERIES-CB
DIST-SET F TC TN 1967

NEWTON'S EQUAL AREAS 8 MIN

ANIMATED. BASED ON ISAAC NEWTON'S SIMPLE GEOMETRICAL PROOF OF THE LAW OF AREAS FOR ANY CENTRAL FORCE. IT FIRST ESTABLISHES THE LAWS OF MOTION, IN THE FORM NEEDED BY NEWTON, GOES THROUGH NEWTON'S PROOF FOR SEVERAL DIFFERENT CASES, INCLUDING THE LIMIT CONSIDERATIONS, AND THEN SHOWS SEVERAL EXAMPLES (FIRST SIMPLE, THEN COMPLEX) OF EQUAL AREAS BEING TRACED OUT WITH A CENTRAL FORCE.
COLLABORATOR--ALFRED BORK

PROD-CORN 16 COLOR
DIST- RE 1967

NEWTON'S LAW OF MOTION 4 MIN

COMPUTER ANIMATED. SHOWS HOW A BODY RESPONDS TO A FORCE ACCORDING TO NEWTON'S LAWS WITH EXAMPLES OF NO FORCE, CONSTANT FORCE, AND CHANGING FORCE. EXCERPT FROM ''FORCE, MASS, AND MOTION.''
COLLABORATOR--FRANK SINDEN

PROD-EDC 8 BW SERIES-CB
DIST-SET F TC TN 1967

NEWTON'S FIRST AND SECOND LAWS 4 MIN

A TEN METER AIR TRACK IS INCLINED AT EACH END TO REVERSE THE DIRECTION OF A GLIDER WITH MINIMAL ENERGY LOSS. THE TRANSIT TIME OF THE GLIDER OVER A FIXED LEVEL INTERVAL IS RECORDED SEVERAL TIMES. THE GLIDER IS THEN ACCELERATED OVER A KNOWN DISTANCE BY A CONSTANT FORCE, AND THE TIME IS MEASURED.
COLLABORATOR--JOHN STULL

PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

NEWTON'S SATELLITE

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

NEWTON'S SECOND LAW OF MOTION 8 MIN

STOPCLOCK ACTUATED BY PHOTOCELLS MEASURES THE TIME CONSTANT FORCE TO COVER DIFFERENT DISTANCES. VARYING THE MASS OF THE TROLLEY AND THE FORCE APPLIED SHOWS THAT ACCELERATION IS PROPORTIONAL TO F/M.
PROD-PURDUE 16 COLOR
DIST-PURDUE RE SOUND 1960

NEWTON'S THIRD LAW 3 MIN

TWO LINEAR AIR TRACK GLIDERS, INITIALLY AT REST, ARE FORCED APART BY A COMPRESSED SPRING. THE DISTANCES TRAVELED ARE MEASURED. THE OSCILLATION OF PAIRS OF GLIDERS (OF EQUAL AND UNEQUAL MASSES) JOINED BY A SPRING IS OBSERVED.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

NORMAL MODES 4 MIN

TWO NORMAL MODES (SYMMETRIC AND ANTISYMMETRIC) FOR TWO COUPLED PENDULA ARE COMPARED WITH TWO SINGLE PENDULA EACH HAVING A LENGTH EQUAL TO THAT OF ONE NORMAL MODE. THE FREQUENCIES OF THE SINGLE PENDULA EQUAL THOSE OF THE TWO NORMAL MODES OF THE COUPLED PENDULA. THE SINGLE PENDULA SHOW BEATS, THE COUPLED PENDULA EXCHANGE ENERGY AT THIS BEAT FREQUENCY.
COLLABORATOR--ALAN HOLDEN
PROD-EDC 8,8S,16 COLOR SERIES-CC
DIST-SET F TC,RE TN 1964

ONE-DIMENSIONAL COLLISIONS 4 MIN

COLLIDING STEEL BALLS (350 GM AND 532 GM) HANG FROM LONG BIFILAR SUSPENSIONS. DIAGRAMS BENEATH GIVE THE MASSES AND DESCRIBE CONDITIONS BEFORE EACH COLLISION--FIRST ONE AT REST, THEN BOTH IN MOTION. STUDENT CAN CONFIRM CONSERVATION OF KINETIC ENERGY. SEVEN STROBOSCOPIC PHOTOGRAPHS OF THE COLLISIONS WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

ONE-DIMENSIONAL MOTION 3 MIN

A CART ON A 20-FOOT TRACK IS PULLED BACK AND FORTH BY A CHAIN DRIVE WHILE A SMALL X-Y RECORDER, MOUNTED ON AN OVERHEAD PROJECTOR, PLOTS THE DISPLACEMENT, VELOCITY, AND ACCELERATION OF THE CART AS A FUNCTION OF TIME. THE MOTION OF THE CART AND THE X-Y RECORDER ARE SHOWN SIMULTANEOUSLY.
COLLABORATOR--H. F. MEINERS
PROD-EFL 8,8S COLOR
DIST-EFL TC TN 1966

ORBITING BODIES IN VARIOUS FORCE FIELDS, PART I 3 MIN

COMPUTER ANIMATED. SHOWS BEHAVIOR OF TWO UNEQUAL MASSES MOVING UNDER POSITIVE POWER LAWS. THE FORCE IS PROPORTIONAL TO THE NTH POWER OF THE SEPARATION, R, WITH N = 1, 3, AND INFINITY. EXCERPT FROM ''FORCE, MASS, AND MOTION.''
COLLABORATOR--FRANK SINDEN
PROD-EDC 8 BW SERIES-OB
DIST-SET F TC TN 1967

ORBITING BODIES IN VARIOUS FORCE FIELDS, PART II 5 MIN

COMPUTER ANIMATED. SHOWS BEHAVIOR OF TWO UNEQUAL MASSES MOVING UNDER NEGATIVE POWER LAWS. THE FORCE IS PROPORTIONAL TO THE NTH POWER OF THE SEPARATION, R, WITH N = -1, -2, AND -3. ALSO SHOWS INSTABILITY FOR N = -3. EXCERPT FROM ''FORCE, MASS, AND MOTION.''
COLLABORATOR--FRANK SINDEN
PROD-EDC 8 BW SERIES-OB
DIST-SET F TC TN 1967

OTHER OSCILLATORS 3 MIN

DEMONSTRATES EXCHANGE OF ENERGY BETWEEN COUPLED MECHANICAL OSCILLATORS MADE FROM A VARIETY OF VERY SIMPLE MATERIALS.
COLLABORATOR--ALAN HOLDEN
PROD-EDC 8,8S,16 COLOR SERIES-CO
DIST-SET F TC,RE TN 1964

PENDULA--FORCED DAMPED HARMONIC OSCILLATORS 4 MIN

TRANSIENT AND STEADY STATE BEHAVIOR ARE SHOWN WITH THE PENDULA DRIVEN BY A MASSIVE PENDULUM OF VARIABLE LENGTH. STEADY STATE BEHAVIOR DISPLAYS AN AMPLITUDE VERSUS NATURAL FREQUENCY CURVE WITH A 90 DEGREE PHASE SHIFT AT RESONANCE.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

PERFECTLY INELASTIC ONE-DIMENSIONAL COLLISIONS 4 MIN

TWO BALLS IN COLLISION (443 GM AND 662 GM) ARE COVERED WITH PLASTICENE AND BECOME LODGED TOGETHER. COLLISIONS INCLUDE ONE AT REST, BOTH IN MOTION. CONTAIN MEASURABLE EVENTS. SEVEN STROBOSCOPIC PHOTOGRAPHS OF THE COLLISIONS WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

PERFECTLY INELASTIC TWO-DIMENSIONAL COLLISIONS 4 MIN

TWO PLASTICENE-COVERED BALLS (500 GM EACH) OF EQUAL SIZE COLLIDE AND BECOME LODGED TOGETHER. TWO EVENTS --BOTH IN MOTION, ACUTE INCIDENCE AND BOTH IN MOTION, OBTUSE ANGLE. CENTER OF MASS OF LODGED PAIR COINCIDES WITH GEOMETRIC CENTER AND IS EASILY MEASURED. SEVEN STROBOSCOPIC PHOTOGRAPHS OF COLLISIONS WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

PRINCIPLES OF THE GYROSCOPE 10MIN

BASIC PRINCIPLES OF GYROSCOPE'S RIGIDITY IN SPACE AND PRECESSION ARE ILLUSTRATED.
PROD-USN 16 BW
DIST-USN RE SOUND 1944

PROJECTILES

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

PULSES 5 MIN

ILLUSTRATES THE ABILITY OF ONE-DIMENSIONAL PULSES TO TRANSPORT ENERGY OVER RELATIVELY LARGE DISTANCES WHILE THE VARIOUS PARTS OF THE MEDIUM UNDERGO ONLY SMALL DISPLACEMENTS FROM THEIR EQUILIBRIUM POSITION. SHOWS THAT ENERGY CAN BE TRANSMITTED FROM POINT A TO POINT B WITHOUT ANY MATTER BEING TRANSPORTED.
PROD-UNESCO 8 BW SERIES-PPP
DIST-UNESCO TC TN 1964

RECOIL 4 MIN

AN ANCIENT CANNON HUNG FROM CABLE SHOOTS OUT A BALL IN SLOW MOTION. STUDENTS CAN FIND THE RATIO OF MASSES OF BALL AND CANNON.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

RESONANCE

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

RING OF COUPLED PENDULA I--NORMAL MODES 3 MIN

SIX BIFILAR PENDULA, ARRANGED IN A RING AND COUPLED BY TIES, EXHIBIT SIX NORMAL MODES OF MOTION, WHICH ARE CONVENIENTLY EXCITED BY ESTABLISHING APPROPRIATE INITIAL CONDITIONS WITH A TEMPLATE.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

RING OF COUPLED PENDULA II--MIXTURES OF NORMAL MODES 3 MIN

ANY MOTION OF THE ASSEMBLY OF SIX COUPLED PENDULA CAN BE REGARDED AS A SUPERPOSITION OF SEVERAL NORMAL MODES. VISUALLY INTERESTING CASES ARISE WHEN ONLY TWO MODES OF DIFFERENT FREQUENCY ARE EQUALLY EXCITED. THEN THE TWO MODES BEAT AGAINST EACH OTHER, AND THE DIVISION OF ENERGY BETWEEN THE PENDULA PULSATES AT THE BEAT FREQUENCY.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

ROTATING REFERENCE FRAMES 4 MIN

A CART MOVING AT CONSTANT VELOCITY SPRAYS FOUR PAINT DOTS PER SECOND ON A ROTATING WHEEL AND ON A CARD AT REST IN THE LABORATORY. ILLUSTRATES INERTIAL AND NON-INERTIAL FRAMES OF REFERENCE, CENTRIFUGAL AND CENTRIPETAL FORCES OR PSEUDO-FORCES, AND THE CORIOLIS FORCE.
COLLABORATOR--H. F. MEINERS
PROD-EFL 8,8S COLOR
DIST-EFL TC TN 1966

ROTATIONAL DYNAMICS--KINETIC ENERGY 9 MIN

A TORQUE IS APPLIED TO HEAVY RING SUPPORTED FROM A LIGHT FRAME ATTACHED TO A SHAFT WHICH IS FREE TO ROTATE. TORQUE ALLOWED TO ACT THROUGH A DEFINITE ANGLE - SPEED OF ROTATION OF RING MEASURED AND USED TO ESTABLISH EXPRESSION FOR KINETIC ENERGY OF ROTATION.
PROD-PURDUE 16 COLOR
DIST-PURDUE RE SOUND 1960

SAND PENDULUM I--POINT SUSPENSION 4 MIN

THE BOB OF A SPHERICAL PENDULUM IS FREE TO MOVE OVER THE SURFACE OF A HEMISPHERE. WHEN IT IS SIMPLY RELEASED FROM SOME INITIAL POSITION, THE BOB TRAVELS ALONG A GREAT CIRCLE AND PRECESSES AT THE ''FOUCAULT RATE.'' STARTED BY A PUSH ALONG SOME OTHER DIRECTION, THE BOB TRAVERSES A ROUGHLY ELLIPTICAL PATH - AND THE AXES OF THE ELLIPSE PRECESS FASTER THAN THE ''FOUCAULT RATE.''
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

SAND PENDULUM II--SADDLE SUSPENSION 3 MIN

DEMONSTRATES AND EXPLAINS NORMAL MODES, LISSAJOUS FIGURES, ASSYMPTOTES, AND THE RELATION BETWEEN THE PERIODS OF NORMAL MODES AND THE PERIOD OF COMPOSITE MOTIONS.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

SAND PENDULUM III--SHORT SADDLE SUSPENSION 4 MIN

WHEN A SIMPLE SADDLE SUSPENDING A PENDULUM IS MADE VERY SHORT, THE BEHAVIOR OF THE PENDULUM SHOWS ESPECIALLY CLEARLY THE INGREDIENTS DERIVED FROM THE BEHAVIOR OF BOTH THE SPHERICAL PENDULUM AND THE PENDULUM ON A SADDLE.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

SAND PENDULUM IV--MULTIPLE SADDLE SUSPENSION 4 MIN

A PENDULUM ON A SIMPLE SADDLE IS SUSPENDED FROM A SECOND SADDLE. SUCH A PENDULUM STILL EXHIBITS THE MUTUALLY PERPENDICULAR NORMAL MODES, NO MATTER HOW THE SECOND SADDLES ARE TURNED WITH RESPECT TO THE FIRST.
COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN
PROD-EDC 8,8S,16 COLOR SERIES-BP
DIST-SET F TC,RE TN 1967

SCATTERING OF A CLUSTER OF OBJECTS 3 MIN

A RAPIDLY MOVING STEEL BALL (543 GM) HITS A CLUSTER OF SIX STEEL BALLS OF DIFFERENT MASSES AT REST. THE EVENT IS PLANAR. STROBOSCOPIC PHOTOGRAPHS OF THE COLLISION WITH NOTES AVAILABLE.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-E
DIST-EBF TC,RE TN,SN 1967

SHAPE OF LIQUID DROPS 4 MIN

EFFECT OF SURFACE TENSION ON THE SHAPE OF DROPS CAN BE EXPLAINED BY THE TENDENCY FOR THE DROP TO MINIMIZE SURFACE ENERGY BY MINIMIZING SURFACE AREA. THEORETICAL SHAPE OF DROP (SPHERICAL) IS ATTAINED BY ADDING DROPS TO AN IMMISCIBLE LIQUID WITH THE SAME DENSITY.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

SIMPLE HARMONIC MOTION (PROD-AP) 10MIN

EXAMPLES OF SIMPLE HARMONIC MOTION ARE ILLUSTRATED AND THE RELATIONSHIP BETWEEN FORCE AND DISPLACEMENT IS ANALYZED BY A CIRCLE OF REFERENCE SHOWING THAT ACCELERATION IS ALWAYS TOWARD THE CENTER AND DIRECTLY PROPORTIONAL TO THE DISTANCE FROM IT, WHILE SPEED DECREASES AS DISTANCE INCREASES.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1953

SIMPLE HARMONIC MOTION--THE STRINGLESS PENDULUM 3 MIN

A CURVED LINEAR AIR TRACK PRODUCES A GRAVITATIONAL POTENTIAL ENERGY WELL CAUSING A GLIDER TO OSCILLATE IN SIMPLE HARMONIC MOTION. THE TRACK IS INCLINED AND THE NEW EQUILIBRIUM MEASURED. RADIUS OF CURVATURE OF TRACK CAN BE CALCULATED, AS CAN G (PERIOD OF OSCILLATION IS MEASURED). FINALLY, A MOVING GLIDER CARRYING A SMALL SPHERE AND A TEST TUBE CONTAINING LIQUID ILLUSTRATES NON-INERTIAL FRAMES OF REFERENCE.
COLLABORATOR--JOHN STULL
PROD-EFL 8,8S,16 COLOR SERIES-LAT
DIST-EFL TC,RE TN 1966

SIMULTANEITY 5 MIN

ANIMATED. DEMONSTRATION OF SIMULTANEITY.
PROD-WAYNE 16 BW
DIST-WAYNE RE SOUND

SOAP FILM OSCILLATIONS 3 MIN

THE VIBRATIONS OF SOAP FILMS ON WIRE FRAMES SHOW VARIOUS MODES OF OSCILLATION. SEVERAL MODES ARE SHOWN FOR A CIRCULAR MEMBRANE AND FOR A RECTANGULAR MEMBRANE. SOME OF THE HIGHER ORDER MODES ARE SHOWN IN SLOW MOTION.
PROD-EDC 8,16 BW
DIST-SET F TC,RE TN 1965

STROBOSCOPIC PHOTOGRAPHY AS A MEANS OF MEASURING SPEED 4 MIN

A CAMERA AND AN ELECTRONIC FLASHER ARE USED TO PHOTOGRAPH A TENNIS SERVICE. FROM THE PHOTOGRAPH THE SPEED AT WHICH THE BALL LEAVES THE RACKET CAN BE CALCULATED. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE	8	BW	SERIES-BBC
DIST-ICF	TC	TN	1966

TACOMA NARROWS BRIDGE COLLAPSE 4 MIN

LARGE AMPLITUDE RESONANCE VIBRATION OF BRIDGE - NODAL LINE ON SURFACE OF ROADWAY - TOTAL COLLAPSE.

PROD-MILLER	8,8S,16	COLOR	SERIES-DP
DIST-EFL	TC,RE	TN	1963

TIME DILATION--AN EXPERIMENT WITH MU-MESONS 36MIN

SHOWS DILATION OF THE LIFELINES OF COSMIC RAY MU-MESONS. TIME DISTRIBUTION OF THE DECAYS OF MU-MESONS AT REST AND COUNTING RATED FOR MU-MESONS WITH SPEEDS OF ABOUT .99 THE SPEED OF LIGHT, WHICH ARRIVE AT THE TOP OF MT. WASHINGTON, NEW HAMPSHIRE, ARE DETERMINED AND THE NUMBER THAT SURVIVE TO REACH SEA-LEVEL IS MEASURED. CONCLUDES THAT MESONS MOVING AT .99C KEEP TIME AT ABOUT 1/9TH THE RATE THEY DO WHEN AT REST. COLLABORATORS--DAVID H. FRISCH AND JAMES H. SMITH

PROD-EDC	8	BW	SERIES-CPF
DIST-EDC	FC	TN	1962

TWO-DIMENSIONAL COLLISIONS 4 MIN

STEEL BALLS HANGING FROM SINGLE 32-FOOT FINE WIRES ARE RELEASED SIMULTANEOUSLY AND COLLIDE. COLLISIONS ARE FILMED FROM A 25-FOOT STEEL TOWER. ONE SLOW MOTION QUANTITATIVE PROBLEM IS GIVEN. SEVEN STROBOSCOPIC PHOTOGRAPHS OF THE COLLISION ARE AVAILABLE.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-E
DIST-EBF	TC,RE	TN,SN	1967

TYPES OF MOTION 4 MIN

UNIFORM RECTILINEAR MOTION, UNIFORMLY ACCELERATED RECTILINEAR MOTION, VARYING RECTILINEAR MOTION, OSCILLATORY RECTILINEAR MOTION. THE PROGRESSION FROM RECTILINEAR OSCILLATORY MOTION TO UNIFORM CIRCULAR MOTION. ACCELERATED CIRCULAR MOTION. VARYING CURVILINEAR MOTION.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1965

UNIFORM ACCELERATION 4 MIN

FORCES ARE APPLIED BY WEIGHTS HANGING FROM A CORD PASSING FREELY OVER A PULLEY TO A TROLLEY ON A FRICTION-COMPENSATED PLANE. A SPRING ASSUMED TO OBEY HOOKE'S LAW IS USED TO MEASURE THE FORCES. ACCELERATIONS ARE CALCULATED FROM THE TRACE MADE BY A VIBRATING WHEEL BRUSH. COLLABORATORS--B. K. HARRIS AND G. R. NOAKES

PROD-ECTHEN	8	COLOR	SERIES-MECH
DIST-FAC	TC	TN	1964

UNIFORM CIRCULAR MOTION 8 MIN

SHOWS LINK BETWEEN TANGENTIAL VELOCITY AND CENTRIPETAL ACCELERATION AND A MEANS OF FINDING THEIR DIRECTIONS AND MAGNITUDES. ILLUSTRATES CENTRIPETAL FORCE IN VARIETY OF WAYS. COLLABORATOR--AAPT

PROD-AP	16	BW	SERIES-PHYS
DIST-MGHT	RE	SOUND	1952

UNIFORM LINEAR VELOCITY 2 MIN

ILLUSTRATES THE CONCEPT OF INERTIA--THAT A BODY REMAINS IN A STATE OF REST, OR OF UNIFORM MOTION IN A STRAIGHT LINE UNLESS ACTED UPON BY AN EXTERNAL FORCE. COLLABORATORS--B. K. HARRIS AND G. R. NOAKES

PROD-EOTHEN	8	COLOR	SERIES-MECH
DIST-FAC	TC	TN	1964

UNIFORMLY ACCELERATED MOTION 4 MIN

CARBON DIOXIDE PUCK IS PULLED ALONG HORIZONTAL GLASS PLATE BY A CONSTANT FORCE. SEVERAL CASES ARE SHOWN DISTANCE AND SPEED ARE GRAPHED BY ANIMATION. STROBOSCOPIC PHOTOGRAPHS ARE AVAILABLE.

PROD-NFBC	8,8S,16	COLOR	SERIES-KINE
DIST-EBF	TC,RE	TN	1964

VECTOR ADDITION I 4 MIN

A MOTORBOAT HEADS UPSTREAM, DOWNSTREAM AND STRAIGHT ACROSS A RIVER. IN EACH CASE A FLOAT IS PLACED INTO THE RIVER. STUDENT CAN MEASURE ALL THREE VELOCITIES INVOLVED--BOAT RELATIVE TO THE GROUND - WATER RELATIVE TO THE GROUND - BOAT RELATIVE TO THE WATER--AND CONFIRM THE ADDITION LAW.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-M
DIST-EBF	TC,RE	TN,SN	1967

VECTOR ADDITION II 4 MIN

A PLANE IS FLYING SUCH THAT ITS SHADOW PHOTOGRAPHED FROM THE PLANE FOLLOWS ALONG A STRAIGHT ROAD. MARKERS ON THE ROAD ALLOW THE MEASUREMENT OF GROUNDSPEED. SHADOW ORIENTATION GIVES THE DIRECTION OF PLANE'S TRUE AIR VELOCITY AND COCKPIT DIAL GIVES ITS MAGNITUDE. STUDENT CAN FIND THE WIND VELOCITY.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-M
DIST-EBF	TC,RE	TN,SN	1967

VELOCITY AND ACCELERATION IN CIRCULAR MOTION 4 MIN

COMPUTER ANIMATED. DISPLACEMENT, VELOCITY, AND ACCELERATION ARE EXAMINED SIMULTANEOUSLY FOR SPOT IN CIRCULAR MOTION. ACCELERATION VECTOR LEADS VELOCITY VECTOR BY 90 DEGREES. LIKEWISE, VELOCITY VECTOR LEADS DISPLACEMENT VECTOR BY 90 DEGREES. VELOCITY IS SHOWN TO DEPEND ON HOW DISPLACEMENT CHANGES. COLLABORATOR--FRANCIS FRIEDMAN

PROD-EDC	8,16	BW	SERIES-VK
DIST-SET F	TC,RE	TN	1964

VELOCITY AND ACCELERATION IN FREE FALL 2 MIN

COMPUTER ANIMATED. SPOT MOVES VERTICALLY UP AND DOWN. VELOCITY AND ACCELERATION VECTORS DISPLAYED ALONG WITH SPOT'S DISPLACEMENT SHOW THAT ACCELERATION DOES NOT CHANGE. INTRODUCES IDEA THAT ACCELERATION DEPENDS ON FORCE ACTING ON A BODY AND ALLOWS COMPARISON BETWEEN CONSTANT ACCELERATION VECTOR IN FREE FALL AND CONSTANT DOWNWARD PULL OF GRAVITY. COLLABORATOR--FRANCIS FRIEDMAN

PROD-EDC	8,16	BW	SERIES-VK
DIST-SET F	TC,RE	TN	1964

VELOCITY AND ACCELERATION IN SIMPLE HARMONIC MOTION 2 MIN

COMPUTER ANIMATED. DISPLACEMENT, VELOCITY, AND ACCELERATION ARE EXAMINED SIMULTANEOUSLY FOR SPOT MOVING IN SIMPLE HARMONIC MOTION. COLLABORATOR--FRANCIS FRIEDMAN

PROD-EDC	8,16	BW	SERIES-VK
DIST-SET F	TC,RE	TN	1964

VELOCITY IN CIRCULAR AND SIMPLE HARMONIC MOTION 3 MIN

COMPUTER ANIMATED. SPOT MOVING CLOCKWISE AND THEN COUNTERCLOCKWISE IN A CIRCLE IS COMPARED TO ITS VELOCITY VECTOR AT SEVERAL DIFFERENT SPEEDS. SPOT MOVING IN SIMPLE HARMONIC MOTION IS TREATED SIMILARLY. COLLABORATOR--FRANCIS FRIEDMAN

PROD-EDC	8,16	BW	SERIES-VK
DIST-SET F	TC,RE	TN	1964

VELOCITY VECTOR, THE 3 MIN

COMPUTER ANIMATED. MOVEABLE SPOT IS ESTABLISHED ON OSCILLOSCOPE SCREEN. COMPUTER MEASURES SPEED AND DIRECTION OF MOTION AND DISPLAYS THIS ADDITIONAL INFORMATION ON SCREEN IN THE FORM OF AN ARROW--THE VELOCITY VECTOR. LINEAR MOTION IN SEVERAL DIRECTIONS AND AT SEVERAL SPEEDS IS EXAMINED.
COLLABORATOR--FRANCIS FRIEDMAN
PROD-EDC 8,16 BW SERIES-VK
DIST-SET F TC,RE TN 1964

WILBERFORCE PENDULUM, THE 4 MIN

RESONANCE BETWEEN TORSIONAL VIBRATION AND TRANSLATIONAL VIBRATION OF A RIGID BODY SUSPENDED BY A HELICAL SPRING. ENERGY TRANSFORMATION--KINETIC AND POTENTIAL ROTATIONAL AND TRANSLATIONAL.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

Thermodynamics

AIR HAS WEIGHT 3 MIN

SHOWS EXPERIMENT USING A SIMPLE BALANCE AND A FOOTBALL BLADDER.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

AIR OCCUPIES SPACE 2 MIN

SUPPLEMENTS TEACHER'S DEMONSTRATION SHOWING THAT WATER WILL FLOW INTO A BOTTLE ONLY IF THE AIR INSIDE IT CAN ESCAPE.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

ATMOSPHERIC STABILITY AND INSTABILITY--STABILITY AND THE WEATHER 8 MIN

EXPLAINS EXISTING LAPSE RATE ON THE RADIOSONDE OBSERVATION CHART AND RELATIONSHIP TO STABILITY AND INSTABILITY IN THE ATMOSPHERE.
PROD- 16 COLOR
DIST-DUART RE SOUND

BROWNIAN MOTION 5 MIN

NO INFORMATION AVAILABLE.
NOT AVAILABLE FOR SALE
PROD-ZUR 8,16 BW SERIES-TCKT
DIST-ZUR TC,RE TN 1966

BROWNIAN MOTION (GERMAN) 6 MIN

SHOWS A MECHANICAL ANALOG OF BROWNIAN MOTION AND FIVE DIFFERENT DEMONSTRATIONS OF THE BROWNIAN MOTION OF PARTICLES SUSPENDED IN VARIOUS LIQUIDS.
COLLABORATOR--W. LOCHTE-HOLTGREVEN
PROD-IWF 16 BW
DIST-AIP RE SILENT 1949

BROWNIAN MOVEMENT (FRENCH) 3 MIN

MOVEMENTS OF SMALL PARTICLES OBTAINED BY DILUTING POWDERED TITANIUM OXIDE IN WATER. DIFFERENCE IN MOBILITY BETWEEN SMALL AND LARGE PARTICLES. FRENCH SUBTITLES.
PROD-FRAN 16 BW
DIST-FREM RE SILENT 1960

BROWNIAN MOVEMENT 1 AND 2 4 MIN

THE IRREGULAR MOVEMENT OF PARTICLES IN TOBACCO SMOKE DUE TO RANDOM MOLECULAR BOMBARDMENT AND THE SIMILAR EFFECT IN GAMBOGE PARTICLES IN A LIQUID ARE SHOWN.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

CARNOT CYCLE AND THE KELVIN TEMPERATURE SCALE 6 MIN

FOUR PROCESSES OF THE IDEAL CARNOT CYCLE ILLUSTRATED BY MOTION OF PISTON ALONG WITH ANIMATED PRESSURE-VOLUME DIAGRAM. DEFINES KELVIN SCALE, DISCUSSES EFFICIENCY IN TERMS OF KELVIN TEMPERATURE OF SOURCE AND OF RESERVOIR.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1953

CHARACTERISTIC SURFACE OF FLUIDS (FRENCH) 10 MIN

ISOTHERMS OF FLUIDS IN A F, PV SYSTEM OF COORDINATES, BETWEEN 0 AND 500 DEGREES C. GENERATION OF THE CHARACTERISTIC SURFACE. AREAS FOR THE VARIOUS STATES OF FLUIDS. THE CAILLETET MACHINE AND CONTINUITY BETWEEN GASEOUS AND LIQUID STATES. TEMPERATURES, PRESSURES AND TRAJECTORIES OF THE CHARACTERISTIC POINT.
PROD-CDC 16 BW
DIST-CDC RE SILENT 1960

CONVECTION OF WATER, THE 4 MIN

ANIMATED DIAGRAM OF A DOMESTIC HOT-WATER SYSTEM IS FOLLOWED BY DEMONSTRATION WHICH PICTURES THE CIRCULATION OF WATER THROUGH THE SYSTEM.
PROD-EOTHEN 8 COLOR SERIES- HEAT
DIST-FAC TC TN 1964

CRITICAL TEMPERATURE 4 MIN

GLASS TUBE CONTAINING ETHER IS RAISED ABOVE CRITICAL TEMPERATURE AND ALLOWED TO COOL - INTERFACE APPEARS IN VIGOROUS ACTION AFTER SEVERAL DEGREES OF SUPERCOOLING.
PROD-MILLER 8,8S,16 COLOR SERIES-CP
DIST-EFL TC,RE TN 1963

CRITICAL TEMPERATURE OF SULFUR DIOXIDE, THE 3 MIN

SHOWS THE TRANSITION OF SULFUR DIOXIDE FROM THE LIQUID TO THE GASEOUS STATE AND VICE VERSA AS IT PASSES THROUGH ITS CRITICAL TEMPERATURE.
PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

DETERMINATION OF VAPOR PRESSURE BY BAROMETER 5 MIN

SHOWS THE DETERMINATION OF THE VAPOR PRESSURE, AT LABORATORY TEMPERATURE, OF ETHYL ETHER, ETHYL ALCOHOL, AND WATER.
PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

DIFFUSION 4 MIN

A POPULATION OF SMALL, YELLOW PUCKS IS IN TEMPERATURE EQUILIBRIUM ON AN AIR TABLE WHEN PUCKS OF A DIFFERENT COLOR ARE SUDDENLY ADDED ALONG ONE SIDE. THE TIME REQUIRED BY THE FIRST OF THESE PUCKS TO ARRIVE AT THE FAR SIDE IS THEN MEASURED WITH A STOP CLOCK IN A NUMBER OF RUNS, WHILE THE MASS AND SIZE OF THE DIFFUSING PUCKS AND THE TEMPERATURES OF THE WALLS ARE EACH VARIED. ALSO CONSIDERED IS THE STEADY STATE, SPECIAL DISTRIBUTION OF THE DIFFUSING PUCKS.
COLLABORATOR--HAROLD DAW
PROD-EFL 8,8S COLOR SERIES-KT
DIST-EFL TC TN 1966

DIFFUSION, PART I 3 MIN

COMPUTER-GENERATED FILM SHOWING RANDOM WALK OF SPOTS STARTING FROM A LINE. CHANGES IN DISTRIBUTION CURVE ARE SHOWN SIMULTANEOUSLY.
PROD-BTL 8S BW
DIST-BTL TC TN

DIFFUSION, PART II 4 MIN

CONTINUATION OF PART I.
PROD-BTL 8S BW
DIST-BTL TC TN

DISTRIBUTION OF MOLECULAR SPEEDS 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

EMISSION AND ABSORPTION OF RADIATION, THE 5 MIN

A LESLIE'S CUBE FILLED WITH HOT WATER IS KEPT AT CONSTANT TEMPERATURE WITH A BUNSEN BURNER. RADIATION INTENSITY FROM CUBE FACE IS MEASURED WITH THERMOPILE. THEN SHOWS THE ABSORPTION OF INFRARED BY GLASS, WATER, AND A SOLUTION OF IODINE IN CARBON DISULPHIDE. DULL BLACK SURFACES ARE SHOWN TO BE BETTER ABSORBERS OF RADIATION THAN BRIGHT ONES.
PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

EQUIPARTITION OF ENERGY 4 MIN

TWO POPULATIONS OF PUCKS WITH MASSES OF M AND 2M ARE STUDIED AT A CONSTANT ''TEMPERATURE,'' T, BY USING THE WHITE TRAIL VELOCITY MEASURING TECHNIQUE. VELOCITY HISTOGRAMS WITH SUPERIMPOSED, THEORETICAL CURVES ARE PREPARED FOR THE TWO POPULATIONS. THEN THE MEAN SQUARE VELOCITIES ARE COMPARED, VERIFYING THAT MV2=KT IS A GENERAL LAW FOR MIXED PUCK POPULATIONS.
COLLABORATOR--HAROLD DAW
PROD-EFL 8,8S COLOR SERIES-KT
DIST-EFL TC TN 1966

FORMATION OF MIST, THE 1 MIN

SHOWS FORMATION OF MIST WHEN SATURATED AIR IN A GLASS TUBE IS COOLED BY RAPID EXPANSION OF THE AIR.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

GASES AND HOW THEY COMBINE 22MIN

VOLUME RATIOS ARE MEASURED FOR COMBINATION OF AMMONIA AND HCL, H AND C, NITRIC OXIDE AND OXYGEN, AND H AND CL. LEADS LOGICALLY TO AVOGADRO'S HYPOTHESIS.
COLLABORATOR--GEORGE C. PIMENTEL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

GAS PRESSURE AND MOLECULAR COLLISIONS 21MIN

STUDIES EFFECTS OF VARYING THE TEMPERATURE AND THE NUMBER OF MOLECULES PER UNIT OF VOLUME. STUDY OF RELATIVE RATES OF EFFUSION OF H, C, CO2, AND SULFUR HEXAFLUORIDE LEADS TO QUANTITATIVE RELATIONSHIP BETWEEN MOLECULAR WEIGHT, MOLECULAR VELOCITY, AND ABSOLUTE TEMPERATURE.
COLLABORATOR--J. ARTHUR CAMPBELL
PROD-CHEM 8 BW
DIST-MLA FC TN

GAS THERMOMETER, THE 5 MIN

TWO BRASS VESSELS, ONE FILLED WITH OXYGEN, THE OTHER WITH HELIUM, ARE FITTED WITH PRESSURE GAUGES. PRESSURE OF THE GAS IN EACH IS MEASURED AT VARIOUS TEMPERATURES BETWEEN 100 DEGREES CENTIGRADE AND TEMPERATURE OF LIQUID NITROGEN. THE DATA NECESSARY TO PLOT TEMPERATURE/PRESSURE GRAPHS FOR EACH GAS IS PROVIDED. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

GRAVITATIONAL SEPARATION 4 MIN

USES A TILTED AIR TABLE WITH VIBRATING WALLS TO SIMULATE THE DISTRIBUTION OF MOLECULES IN A GRAVITATIONAL FIELD. DENSITY DISTRIBUTIONS ARE MEASURED FOR PUCKS OF THE SAME MASS AND FOR PUCKS OF TWO DIFFERENT MASSES.
COLLABORATOR--HAROLD DAW
PROD-EFL 8,8S COLOR SERIES-KT
DIST-EFL TC TN 1966

HEAT DISTRIBUTION IN THE SPECTRUM OF A CARBON ARC 3 MIN

DIAGRAMS ILLUSTRATE THE POSITION OF THE VISIBLE SPECTRUM, THE ULTRA-VIOLET, AND THE INFRARED RELATIVE TO THE ELECTROMAGNETIC SPECTRUM AS A WHOLE.
PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

HEAT--ITS NATURE AND TRANSFER 10MIN

ANIMATED. PRESENTS NATURE OF HEAT AND SOME OF THE PRINCIPAL WAYS IN WHICH HEAT IS TRANSFERRED. DEALS WITH CONDUCTION, CONVECTION, RADIATION - DEVELOPS CONCEPT OF INSULATION.
PROD-EBF 16 BW
DIST-EBF RE SOUND 1958

HEAT TRANSFER AND TWO-PHASE FLUID FLOW STUDIES 5 MIN

RESEARCH EXPERIMENTS ON HEAT TRANSFER AND FLUID FLOW AT ARGONNE.
NOT AVAILABLE FOR SALE
PROD-ANL 16 COLOR
DIST-ANL RE SOUND 1963

HEATING WATER

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-CIL TC TN 1966

INFRARED RADIATION 4 MIN

SHOWS THAT INVISIBLE HEAT RADIATION (COMING FROM A HOT SOLDER-IRON AND DETECTED WITH A PHILIPS 61 SV) HAS SEVERAL PROPERTIES IN COMMON WITH LIGHT--HEAT RADIATION PROPAGATES IN A STRAIGHT LINE, IS ABSORBED DIFFERENTLY BY DIFFERENT MATERIALS, CAN BE REFLECTED, AND CAN BE FOCUSED WITH A LENS.
PROD-UNESCO 8 BW SERIES-FFB
DIST-UNESCO TC TN 1964

KINETIC-MOLECULAR THEORY 9 MIN

PROVIDES INTRODUCTION TO THE THEORY AND DEMONSTRATION OF MOLECULES IN MOTION AND OF THE FACTORS THAT DETERMINE KINETIC ENERGY.
COLLABORATOR--MAX ROSENBERG
PROD-MGHT 16 COLOR
DIST-MGHT RE SOUND 1961

LESLIE'S CUBE 5 MIN

SHOWS HEAT RADIATION OF VARIOUS SUBSTANCES.
PROD-LOEW 16 BW SERIES-PC
DIST-MGHT RE SOUND 1950

MAXWELL BOLTZMAN DISTRIBUTION OF VELOCITIES 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

MAXWELL SPEED DISTRIBUTION 4 MIN

SPEED DISTRIBUTION IS STUDIED WITH A ''HOT GAS'' OF 27 PUCKS MOVING RANDOMLY IN EQUILIBRIUM WITH THE ''HOT'' WALLS OF AN AIR TABLE. THE SPEED OF THE PUCKS IS MEASURED BY SUPERIMPOSED ANIMATION SO THAT EACH PUCK LEAVES BEHIND A TRAIL FOR 1 SEC. A HISTOGRAM OF THE NUMBER OF PUCKS IN A VELOCITY INTERVAL APPROACHES THE MAXWELL DISTRIBUTION FUNCTION FOR A TWO-DIMENSIONAL GAS. FURTHER RUNS SHOW THAT THE DISTRIBUTION CURVE SHIFTS TO THE RIGHT WHEN THE TEMPERATURE OF THE GAS IS RAISED BY MOVING THE WALLS FASTER.
COLLABORATOR--HAROLD DAW
PROD-EFL 8,8S COLOR SERIES-KT
DIST-EFL TC TN 1966

MEANING OF PRESSURE, THE 2 MIN

ILLUSTRATES, USING COMPARATIVELY SIMPLE APPARATUS, THE KINETIC MOLECULAR THEORY OF GAS PRESSURE DUE TO MOVING MOLECULES.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

MECHANICAL EQUIVALENT OF HEAT, THE 5 MIN

WATER IS HEATED IN A LARGE COPPER VESSEL BY THE FRICTION PRODUCED WHEN THE INNER DISC OF A CAR CLUTCH ROTATES AGAINST THE FIXED PLATES ON EITHER SIDE OF IT.

PROD-EOTHEN	8	COLOR	SERIES-HEAT
DIST-FAC	TC	TN	1964

PHASE CHANGE 4 MIN

ILLUSTRATES THE CONSTANT TEMPERATURE OF WATER AT A PHASE CHANGE. DEMONSTRATES THAT BY INCREASING THE PRESSURE DURING A PHASE CHANGE THE TEMPERATURE OF THE BOILING POINT OF WATER CAN BE RAISED.

PROD-EBF	8	COLOR	SERIES-CIC
DIST-EBF	TC	TN	1964

PHASE DEMONSTRATION 1 MIN

NAPHTHALENE POWDER IS HEATED TO PRODUCE THREE PHASES AND THEN COOLED TO SHOW CRYSTAL CONDENSATION FROM VAPOR.

PROD-YALE	8,16	COLOR	SERIES-YCF
DIST-AIM	TC,RE	TN	1963

PHASE DIAGRAM OF AN ALLOY 4 MIN

COOLING CURVES FOR BISMUTH-CADMIUM ALLOYS ARE DERIVED AND DATA PRESENTED FOR THE CONSTRUCTION OF THE PHASE DIAGRAM--A DEMONSTRATED EXPERIMENT FROM WHICH THE STUDENT MAY CONSTRUCT A PHASE DIAGRAM.

PROD-	8	COLOR	
DIST-ACCC	TC	TN	1967

PRESSURE 2--SIMPLE KINETIC THEORY 2 MIN

USES LARGE SCALE MODEL OF A GAS WITH MOVING MOLECULES TO REPRESENT THE BOMBARDMENT OF A SURFACE BY GAS MOLECULES.

PROD-STP	8	COLOR	
DIST-MAC	TC	TN	1963

PROPERTIES OF GAS 4 MIN

THE RATE AT WHICH PUCKS HIT THE WALL OF AN AIR TABLE IS EQUIVALENT TO PRESSURE, THE NUMBER OF PUCKS ON THE TABLE IS CONCENTRATION, AND VOLUME IS CHANGED BY USING A SPECIALLY PREPARED PISTON WHICH MOVES IN AND OUT, WHILE AGITATING AT THE SAME RATE AS THE HOT WALLS. UNIVERSAL GAS LAW RELATIONS ARE COMPOSED WITH MEASUREMENTS OF THE NUMBERS OF PUCKS HITTING ONE WALL DURING SHORT TIME INTERVALS. SHOWS ALSO THE EFFECT OF ISOTHERMAL AND ADIABATIC COMPRESSION OF A SINGLE PUCK.
COLLABORATOR--HAROLD DAW

PROD-EFL	8,8S	COLOR	SERIES-KT
DIST-EFL	TC	TN	1966

RANDOM MOTION 5 MIN

NO INFORMATION AVAILABLE.
NOT AVAILABLE FOR SALE

PROD-ZUR	8,16	BW	SERIES-TDKT
DIST-ZUR	TC,RE	TN	1966

RANDOM WALK AND BROWNIAN MOTION 4 MIN

RANDOM WALK IS STUDIED BY FOLLOWING A SINGLE RED PUCK WITH A LIGHT ON IT MOVING IN A HOT GAS OF YELLOW PUCKS. FROM A POLAROID PHOTOGRAPH OF THE LIGHT THE AUTHOR CONSTRUCTS A TABLE OF PATH LENGTHS, AND A HISTOGRAM OF N (L), THE NUMBER OF PATHS IN THE LENGTH INTERVAL L TO L PLUS DELTA L, AS A FUNCTION OF L. THIS RUN IS COMPARED WITH A SECOND WHERE THE DENSITY (NO. OF PUCKS) IS GREATER. THE EFFECT OF INCREASING THE MASS OF THE STUDIED PARTICLE IS ALSO INVESTIGATED UNTIL THE SITUATION APPROXIMATES BROWNIAN MOTION.
COLLABORATOR--HAROLD DAW

PROD-EFL	8,8S	COLOR	SERIES-KT
DIST-EFL	TC	TN	1966

REFLECTION OF RADIATION, THE 3 MIN

TWO METAL PARABOLIC MIRRORS ARE MOUNTED FACING EACH OTHER 1.5 METERS APART. AT THE FOCUS OF ONE IS A THERMOPILE FACING INTO THE MIRROR, CONNECTED TO A GALVANOMETER. PREVOST'S THEORY OF EXCHANGE IS ILLUSTRATED BY PLACING HOT AND COLD OBJECTS AT THE FOCUS OF THE OTHER MIRROR.

PROD-EOTHEN	8	COLOR	SERIES-HEAT
DIST-FAC	TC	TN	1964

REGELATION (PROD-NOR) 1 MIN

INITIAL SEQUENCE SHOWS THE HANGING OF A WEIGHTED FINE WIRE ACROSS A BLOCK OF ICE. TIME LAPSE PHOTOGRAPHY RECORDS THE PASSING OF THE WIRE THROUGH THE ICE, LEAVING IT IN ONE PIECE. CARTRIDGE ALSO CONTAINS ''CHAIN REACTIONS, CONTROLLED AND UNCONTROLLED.''
NOT AVAILABLE FOR SALE

PROD-NOR	8	BW	
DIST-NOR	TC		

REGELATION (PROD-TECH) 2 MIN

DEMONSTRATION SHOWING A LOADED WIRE CUTTING ITS WAY THROUGH A BLOCK OF ICE AND LEAVING THE ICE IN TACT.

PROD-TECH	8	COLOR	SERIES-HEAT
DIST-EFVA	TC	TN	1963

TEMPERATURE AND THE BOLTZMANN DISTRIBUTION 4 MIN

INFRARED ABSORPTION SPECTROSCOPY IS ANALYZED IN TERMS OF POPULATION OF J STATES AND A TEMPERATURE SCALE DERIVED FROM THEIR BOLTZMANN DISTRIBUTIONS.

PROD-	8	COLOR	
DIST-ACCC	TC	TN	1966

TEMPERATURE WAVES 4 MIN

ROW OF THERMOMETERS INSERTED IN HOLES IN BRASS ROD SHOW WAVE FRONT WHEN ONE END OF THE ROD IS CYCLED IN TEMPERATURE.

PROD-MILLER	8,8S,16	COLOR	SERIES-CP
DIST-EFL	TC,RE	TN	1963

THERMODYNAMICS 10MIN

MOLECULAR ACTION IN HEAT TRANSFER, PHENOMENA OF COMBUSTION, MECHANICS OF THE STEAM ENGINE, STEAM TURBINE, AUTOMOBILE, AND DIESEL.

PROD-EBF	16	BW	
DIST-EBF	RE	SOUND	

TRIPLE POINT OF H2O, THE 4 MIN

ALLOWS WATER TO BOIL UNDER REDUCED PRESSURE UNTIL IT FREEZES. THE RESULTING MIXTURE OF BOILING WATER AND ICE IS VIEWED THROUGH POLAROIDS. SINCE ICE IS DOUBLY REFRACTING, THE INDIVIDUAL CRYSTALS OF ICE APPEAR IN DIFFERENT COLORS. THE EFFECT IS CAUSED BY CRYSTALOGRAPHIC ORIENTATION AND CRYSTAL THICKNESS.

PROD-SET K	16	COLOR	
DIST-SET K	RE	SILENT	1965

TYNDALL'S APPARATUS 3 MIN

HEAT CAPACITY OF VARIOUS SUBSTANCES.

PROD-LOEW	16	BW	SERIES-FD
DIST-MGHT	RE	SOUND	1950

ULTRASONIC THERMOMETER, THE 4 MIN

DESCRIBES THEORY AND OPERATION OF NBS-DEVELOPED THERMOMETER WHICH MEASURES LENGTH OF SOUND WAVES IN HELIUM GAS.
NOT AVAILABLE FOR SALE

PROD-NBS	16	COLOR	
DIST-NBS	RE	SOUND	

VAPOR PRESSURE AND BOILING 4 MIN

A J-TUBE CONTAINS MERCURY, THE SURFACE OF WHICH IS AT A HIGHER LEVEL ON THE CLOSED SIDE THAN ON THE OPEN ONE--THE SPACE ABOVE THE MERCURY ON THE CLOSED SIDE IS FILLED WITH DISTILLED WATER. TUBE IS PLACED IN WATER, THE CLOSED END BELOW THE SURFACE. WHEN THE WATER BOILS, THE MERCURY LEVELS ARE EQUAL.

COLLABORATORS--B. H. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

VAPOR PRESSURE AND TEMPERATURE 3 MIN

WATER FROM A GLASS CASING ON TOP OF MERCURY BAROMETER IS INJECTED INTO ONE OF TWO BAROMETERS SET UP IN THE SAME MERCURY TROUGH. WHEN WATER IN CASING IS HEATED BY BUBBLING STEAM THROUGH IT, MERCURY LEVEL IN BAROMETER CONTAINING WATER DROPS MUCH FARTHER AS THE TEMPERATURE INCREASES.

COLLABORATORS--B. H. HARRIS AND G. R. NOAKES

PROD-EOTHEN 8 COLOR SERIES-HEAT
DIST-FAC TC TN 1964

Electricity and Magnetism

AC AND DC 10MIN

OUTLINES THE DIFFERENCE BETWEEN ALTERNATING AND DIRECT CURRENT, WHY AC IS IN GENERAL USE, HOW DC CAN BE PRODUCED FROM AC AND THE REASONS WHY ONE OR THE OTHER IS USED FOR PARTICULAR PURPOSES.
PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

ALTERNATING CURRENT (DANISH) 6 MIN

ANIMATED. ILLUSTRATES THE CHARACTERISTICS OF THE THREE-PHASE ALTERNATING CURRENT AND ITS MATHEMATICAL FORM, THE SINE CURVE.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1958

AMPERES, VOLTS AND OHMS 8 MIN

EXPLAINS THE MEANING, RELATIONSHIP, AND MEASUREMENT OF THE BASIC UNITS OF ELECTRICITY.
PROD-USN 16 BW SERIES-RTT
DIST-DUART RE SOUND

BASIC ELECTRICITY--AC PARALLEL CIRCUITS 5 MIN

SHOWS ELEMENTS, EXAMINES EFFECTS OF CURRENT, SHOWS WHAT THE GENERATOR SEES IN THE FOLLOWING CIRCUITS-- LC PARALLEL CIRCUIT, WHERE THE INDUCTIVE REACTANCE EXCEEDS THE CAPACITATIVE REACTANCE AND LCR PARALLEL CIRCUIT WHERE THE CAPACITATIVE REACTANCE EQUALS THE INDUCTIVE REACTANCE AND WHERE THE CAPACITATIVE REACTANCE EXCEEDS THE INDUCTIVE REACTANCE.
PROD-USN 16 BW
DIST-DUART RE SOUND

BASIC ELECTRICITY--AC SERIES CIRCUITS 4 MIN

SHOWS ELEMENTS - USING LCR CIRCUIT, EXAMINES EFFECTS OF VOLTAGE AND SHOWS WHAT GENERATOR SEES WHEN THE INDUCTIVE REACTANCE EXCEEDS THE CAPACITATIVE REACTANCE AND WHEN THE CAPACITATIVE REACTANCE EXCEEDS THE INDUCTIVE REACTANCE. DEMONSTRATES A SERIES RESONANT CIRCUIT USING LCR CIRCUIT WHERE THE CAPACITATIVE REACTANCE AND THE INDUCTIVE REACTANCE ARE EQUAL.
PROD-USN 16 BW
DIST-DUART RE SOUND

BASIC ELECTRICITY--CAPACITANCE IN AC CIRCUITS 5 MIN

DEFINES CAPACITANCE AND DEMONSTRATES HOW CAPACITOR WORKS - EXPLAINS CAPACITATIVE REACTANCE AND ITS EFFECTS IN AC CIRCUIT, FACTORS AFFECTING CAPACITATIVE REACTANCE AND PHASE ANGLE - PHYSICAL FACTORS AFFECTING CAPACITANCE AND EFFECT OF CAPACITANCE IN AC CIRCUIT.
PROD-USN 16 BW
DIST-DUART RE SOUND

BASIC ELECTRICITY--INDUCTANCE IN AC CIRCUITS 7 MIN

DEFINES INDUCTANCE - EXPLAINS ITS CAUSE AND EFFECT IN AC CIRCUIT. ILLUSTRATES INDUCTIVE REACTANCE, FACTORS AFFECTING IT IN AC CIRCUIT AND PHASE RELATIONSHIP BETWEEN CURRENT AND VOLTAGE AS RESULT OF PRESENCE OF INDUCTANCE IN THE CIRCUIT.
PROD-USN 16 BW
DIST-DUART RE SOUND

CAPACITORS AND DIELECTRICS 4 MIN

PRESENTS THE CONCEPT OF A CAPACITOR AND DEMONSTRATES THE EFFECT OF VARIOUS PARAMETERS ON CAPACITANCE.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

CHARGE DISTRIBUTION--CONCENTRATION AND POINT DISCHARGE 2 MIN

DEMONSTRATES THAT CHARGE DISTRIBUTED ON A METAL SURFACE TENDS TO BE MORE CONCENTRATED IN AREAS WHERE THE RADIUS OF CURVATURE IS LESS THAN IN AREAS WHERE THE RADIUS OF CURVATURE IS LARGER. WHEN THE RADIUS OF CURVATURE BECOMES SMALL ENOUGH, AS IN THE CASE OF A POINTED CONDUCTOR, THE CONCENTRATION MAY BE HIGH ENOUGH TO FORCE CHARGE TO CROSS AN AIR GAP.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

CHARGE DISTRIBUTION--THE FARADAY ICE PAIL EXPERIMENT 2 MIN

AN ELECTROSCOPE VANE DEFLECTS WHEN A CHARGED SPHERE IS PLACED INSIDE A METAL PAIL ATTACHED TO THE ELECTROSCOPE. VANE COLLAPSES WHEN SPHERE IS REMOVED. WHEN CHARGED SPHERE IS TOUCHED TO INSIDE OF PAIL, CHARGE TRANSFERS TO PAIL AND SPHERE IS UNCHARGED. ATTEMPTS TO REMOVE CHARGE FROM THE PAIL ARE MADE FIRST BY TOUCHING A SPHERE INSIDE, THEN OUTSIDE THE PAIL--THE FORMER FAILS, THE LATTER SUCCEEDS.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

CHARGES IN MOTION--THE FLOW OF CHARGE 3 MIN

SHOWS THAT ELECTRIC CHARGE IN MOTION PRODUCES THE SAME EFFECT ON A SENSITIVE GALVANOMETER AS DOES A CURRENT FROM A BATTERY AND ALSO CAUSES THE VANE OF A PULSED ELECTROSCOPE TO PULSATE.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1965

CHARGES IN MOTION--THE INDUCTION PROCESS 4 MIN

DEMONSTRATES THE SEPARATION OF CHARGES ON A CONDUCTOR PLACED IN AN ELECTRIC FIELD.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1965

COULOMB'S LAW--VARIATION OF FORCE WITH CHARGE 2 MIN

THE DEFLECTION OF A CHARGED PITHBALL SUSPENDED IN THE VICINITY OF A CHARGED SPHERE IS MEASURED. THE SPHERE IS CHARGED BY SUCCESSIVE INCREMENTS OF CHARGE BY TOUCHING IT ON THE INSIDE WITH A CHARGED CONDUCTING PROBE. RESULTS ARE PLOTTED ON GRAPH.
PROD-LEPG 8,16 BW SERIES-LEPAGE
DIST-LEPG TC,RE TN 1966

COULOMB'S LAW--VARIATION OF FORCE WITH DISTANCE 4 MIN

SHOWS THE SAME EXPERIMENTAL SET-UP AS VARIATION OF FORCE WITH CHARGE BUT THE CHARGES ON THE PITHBALL AND SPHERE REMAIN FIXED. THE SEPARATION BETWEEN THEM IS VARIED AND DEFLECTION OF THE SUSPENDED PITHBALL IS OBSERVED. POINTS ARE PLOTTED ON A LOG-LOG GRAPH, SHOWING A SLOPE OF APPROXIMATELY -2.
PROD-LEPG 8,16 BW SERIES-LEPAGE
DIST-LEPG TC,RE TN 1966

DEFLECTION OF ELECTRONS IN A MAGNETIC FIELD(DANISH) 10MIN

SHOWS THE DEFLECTION OF ELECTRONS UNDER THE INFLUENCE OF A MAGNET, IN A CATHODE-RAY TUBE AND IN A WIRE. THE PRINCIPLES OF THE ELECTRIC MOTOR AND THE DRUM ARMATURE ARE DEMONSTRATED.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1952

EFFECTS OF INDUCTORS AND CAPACITORS ON AC AND POWER FACTOR 8 MIN

EXPLAINS THROUGH EXPERIMENTS AND DIAGRAMS THE COMPLEMENTARY EFFECTS OF INDUCTION AND CAPACITY ON AN ALTERNATING CURRENT. THE EFFECT OF HIGH INDUCTANCE OR CAPACITY ON THE POWER FACTOR IN A CIRCUIT. SHOWS HOW VOLTAGE AND CURRENT BECOME OUT OF PHASE.

PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

ELECTRIC CHARGE 4 MIN

USING ELECTROSCOPE, ROD, AND ELECTROPHOROUS PLATE, SHOWS THE TRANSFER, DISTRIBUTION, AND REDISTRIBUTION OF CHARGE. ANIMATED SEQUENCES HELP TO EXPLAIN THE PROCESS.

PROD-LEPG 8,16 BW SERIES-LEPAGE
DIST-LEPG TC,RE TN 1966

ELECTRICITY AND HEAT 8 MIN

SHOWS HOW IN A GOOD CONDUCTOR ELECTRONS PASS FREELY WITH LITTLE RESISTANCE, WHEREAS IN A BAD CONDUCTOR THE MOVEMENT OF THE ELECTRONS SPEEDS UP THE VIBRATION OF THE ATOMS THEMSELVES AND THE MATERIAL GETS HOT. EXPLAINS HOW BY VARYING THE DIAMETER AND LENGTH OF THE ''RESISTOR'' THE HEATING EFFECT CAN BE VARIED.

PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

ELECTRIC LINES OF FORCE 7 MIN

SHOWS HOW TO PRODUCE ELECTRIC FIELD PATTERNS USING NEON SIGN TRANSFORMER AS HIGH VOLTAGE SOURCE.

PROD-EDC 16 BW SERIES-PSSC
DIST-SET 8 RE SOUND 1960

ELECTRODYNAMICS 10MIN

EXPLAINS ELECTRODYNAMICS ON THE HYPOTHESIS THAT ELECTRICAL CURRENTS CONSIST MERELY OF MOTION OF ELECTRICAL CHARGES. TRACES ELECTRICITY FROM GALVANI TO FARADAY'S DISCOVERY OF ELECTROMAGNETIC INDUCTOR.

PROD-EBF 16 BW
DIST-EBF RE SOUND

ELECTROMAGNETIC INDUCTION 5 MIN

FOUR FUNDAMENTAL ILLUSTRATIONS OF THE LAWS OF ELECTROMAGNETIC INDUCTION--THAT AN EMF IS INDUCED IN A COIL IF THE CIRCUIT IS CLOSED WHEN MAGNETIC FLUX THREADING THE COIL IS CHANGING - DIRECTIONAL RELATIONSHIP BETWEEN FIELD, MOTION AND INDUCED CURRENT - LENZ LAW OF ELECTROMAGNETIC INDUCTION - FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION.

PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

ELECTROSCOPE, THE (PROD-EFL) 4 MIN

CLARIFIES OPERATION OF AN ELECTROSCOPE WITH A SIMPLIFIED WORKING MODEL. SHOWS CHARGING BY CONTACT AND BY INDUCTION WITH POSITIVE AND NEGATIVE CHARGE. ALSO DEMONSTRATES A PULSED ELECTROSCOPE.
COLLABORATOR--A. E. WALTERS

PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

ELECTROSCOPE, THE (PROD-LOEW) 4 MIN

DETECTION OF ELECTRIC CHARGES.

PROD-LOEW 16 BW SERIES-PD
DIST-MGHT RE SOUND 1950

ELECTROSTATICS (PROD-EBF) 10MIN

EXPLAINS POSITIVE AND NEGATIVE ELECTRIFICATION AND THE PART PLAYED BY INSULATORS AND CONDUCTORS. COMPTON ELECTROMETER, STATIC ELECTRICITY MACHINE, ANIMATION OF MOVEMENT OF CHARGES IN ELECTROSCOPE INCLUDED.

PROD-EBF 16 BW
DIST-EBF RE SOUND 1950

ELECTROSTATICS (PROD-LEPG) 4 MIN

SIX PROBLEMS WHICH TEST STUDENT ON WHAT HE HAS LEARNED FROM THE OTHER FOUR LOOPS OF THIS SERIES.

PROD-LEPG 8,16 BW SERIES-LEPAGE
DIST-LEPG TC TN 1966

ELECTROSTATIC INDUCTION 4 MIN

DEMONSTRATES CHARGING OF AN ELECTROSCOPE BY INDUCTION. SHOWS SIGN OF CHARGE TO BE OPPOSITE TO THAT OF INDUCING OBJECT.
COLLABORATOR--A. E. WALTERS

PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

ELEMENTS OF ELECTRICAL CIRCUITS 10MIN

CLARIFIES FLOW OF ELECTRONS, RESISTANCE, AND THE OHM, CURRENT AND THE AMPERE, ELECTROMOTIVE FORCE AND THE VOLT. ALSO OHM'S LAW WITH PROBLEMS.

PROD-EBF 16 BW
DIST-EBF RE SOUND

FORCE ACTS ON AN ELECTRIC CHARGE MOVING IN A MAGNETIC FIELD, A 4 MIN

SHOWS EXPERIMENTAL DETAILS AND USES BLACKBOARD DIAGRAM TO EXPLAIN CIRCULAR MOTION OF AN ELECTROLYTE IN A MAGNETIC FIELD. THEN USES A GALVANOMETER TO SHOW THE MOTION OF FREE ELECTRONS WHEN A CONDUCTING WIRE AND THEN A COIL ARE MOVED THROUGH A MAGNETIC FIELD. FINALLY, THE MOTION OF A LARGE COIL THROUGH THE FIELD LIGHTS A LAMP.

PROD- 8 BW
DIST- TC

GAS IONIZATION (FRENCH) 4 MIN

CONVECTION CURRENTS LOCATED ABOVE A FLAME OBSERVABLE BY INTERFEROMETRY CONTAIN POSITIVE AND NEGATIVE IONS THAT SEPARATE INTO TWO STREAMS IF THE FLAME IS PLACED BETWEEN TWO PLATES OF A CHARGED CONDENSER.
NOT AVAILABLE FOR SALE

PROD-FRAN 16 COLOR
DIST-FREM RE SILENT 1961

HIGH FREQUENCY HEATING 9 MIN

AN ALTERNATING ELECTRIC CURRENT IN A CONDUCTOR INDUCES A CURRENT IN A NEAR-BY CONDUCTOR. IF THE SOURCE OF HIGH FREQUENCY CURRENT IS CONNECTED TO PLATES SEPARATED BY A NON-CONDUCTOR NO CURRENT FLOWS, BUT ALTERNATING STRAINS SET UP IN THE DIELECTRIC PRODUCE HEAT.

PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

HOW DOES THE RADIO WORK 8 MIN

EXPLAINS IN GENERAL TERMS HOW SOUND WAVES ARE MODULATED, TRANSMITTED AND RECEIVED.

PROD-CINCEN 16 COLOR
DIST-PHIL RE SOUND 1964

IMMEDIATE FIELD 5 MIN

AN ANALYSIS OF E AND H FIELDS, RELATED TO A HALF-WAVE DIPOLE. ANIMATION ILLUSTRATES HOW TWO MAGNETIC FIELDS ARE PRODUCED WHEN AN ALTERNATING CURRENT IS FED THROUGH A CONDUCTOR.

PROD-NFBC 8,8S,16 COLOR
DIST-EBF TC,RE TN 1965

INDUCTION (DANISH) 7 MIN

ANIMATED. SHOWS DEFLECTIONS OF ELECTRONS IN MAGNETIC FIELDS, AND ILLUSTRATES HOW INDUCED CURRENTS OCCUR IN A WIRE LED THROUGH A MAGNETIC FIELD AND IN A COIL.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1954

INDUCTORS 6 MIN

A SOFT IRON CORE IS INTRODUCED INTO A COIL CARRYING AN ALTERNATING CURRENT. ILLUSTRATES SELF-INDUCTION. EXPLAINS DIAGRAMMATICALLY THE WORKING OF A CHOKE AND THE EFFECT OF VARYING FREQUENCY. EFFECT OF AN INDUCTOR ON THE MAKE AND BREAK OF A CURRENT IS SHOWN.
PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

INSULATORS AND CONDUCTORS 3 MIN

SHOWS THAT SOME MATERIALS, CALLED CONDUCTORS, TRANSFER CHARGE READILY WHEREAS OTHER MATERIALS, CALLED INSULATORS, DO NOT.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

INTRODUCTION TO ELECTROSTATICS 4 MIN

INTRODUCES THE ELECTROSTATIC FORCE, AN ATTRACTIVE OR REPULSIVE FORCE WHICH EXISTS BETWEEN AN ELECTRIFIED BODY AND ITS SURROUNDINGS. USES A SHEET OF PLASTIC, A PLASTIC ROD, AND A GLASS ROD TO CHARGE LIGHT NEUTRAL PARTICLES. BEHAVIOR OF CHARGED PARTICLES IS SHOWN IN SLOW MOTION.
COLLABORATOR-- A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

LENZ LAW I 3 MIN

LARGE SCALE EFFECTS OF THE RESISTANCE TO THE CURRENT GENERATING MOTION OF A CONDUCTOR IN A MAGNETIC FIELD ARE SHOWN WITH PIECES OF SHEET ALUMINUM IN THE 16 KILOGAUSS FIELD OF THE WASHINGTON UNIVERSITY CYCLOTRON MAGNET.
PROD-FOWLER 8 COLOR
DIST-EDC TC TN 1964

LENZ LAW II 3 MIN

THE DEMONSTRATIONS OF PART I ARE CONTINUED BY CONTRASTING THE ALLOWED AND INHIBITED MOTIONS OF A CONDUCTING DISC WITH THOSE OF A HOLLOW CONDUCTING CYLINDER.
PROD-FOWLER 8 COLOR
DIST-EDC TC TN 1964

MAGNETIC FIELD (DANISH) 6 MIN

ANIMATED. SHOWS THAT IN A MAGNET THE MOLECULES LIE IN A CERTAIN ORDER, WHEREAS IN A PIECE OF IRON THEY LIE IN A DISORDERLY WAY, BUT WILL BECOME ORDERED IF A MAGNET IS BROUGHT NEAR. MOVEMENTS OF FREE ELECTRONS IN A MAGNETIC FIELD SHOWN BY ANIMATED DIAGRAMS.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1950

MAGNETIC FIELD SPARK CHAMBER STUDIES 7 MIN

EXPLAINS THE PRINCIPLES OF THE FIRST LARGE MAGNETIC FIELD SPARK CHAMBER (CERN LAB) AND THE MANNER IN WHICH THE CHAMBER IS USED IN EXPERIMENTS DEVOTED TO THE DISCOVERY AND STUDY OF SUBNUCLEAR PARTICLES.
PROD-ANL 16 COLOR
DIST-ANL RE SOUND 1963

MODEL OF A MAGNET

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

MOTOR EFFECT, THE 3 MIN

DEMONSTRATES THE DIRECTIONAL RELATION BETWEEN CURRENT IN A CONDUCTOR, MAGNETIC FIELD, AND FORCE ON THE CONDUCTOR. FLEMING'S LEFT HAND RULE FOR MOTORS IS INTRODUCED TO SHOW HOW THESE DIRECTIONS MAY BE REPRESENTED.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

MUTUAL INDUCTION 3 MIN

SHOWS THAT WHEN A CURRENT IN ONE CIRCUIT IS CHANGING, A CURRENT IS INDUCED IN A SECONDARY CIRCUIT SUFFICIENTLY CLOSE FOR THE CHANGING FLUX IN THE PRIMARY CIRCUIT TO LINK WITH THE SECONDARY.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

OHM'S LAW 6 MIN

EXPLAINS VOLTAGE, CURRENT, ELECTRICAL RESISTANCE AND THEIR INTERRELATIONSHIPS. APPLIES OHM'S LAW TO THE PRINCIPLES OF WATER PRESSURE, FLOW, AND WATER RESISTANCE.
PROD-CORF 16 C,BW
DIST-CORF RE SOUND 1955

PARALLEL WIRE CURRENT BALANCE, A 4 MIN

DEMONSTRATES THAT THE FORCE BETWEEN TWO PARALLEL WIRES, EACH CARRYING THE SAME CURRENT IN SERIES, IS PROPORTIONAL TO THE SQUARE OF THE CURRENT.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1965

PHOTOELECTRIC EFFECT, THE 4 MIN

DEMONSTRATES THAT PHOTONS WITH A FREQUENCY ABOVE THAT OF VISIBLE LIGHT MAY PROVIDE SUFFICIENT ENERGY TO CHARGES ON THE SURFACE OF A CLEAN ZINC SURFACE SO THAT THEY OVERCOME THE POTENTIAL ENERGY BARRIER OF THE SURFACE AND LEAVE THE METAL ENTIRELY. SINCE ONLY NEGATIVELY CHARGED ELECTRONS ARE AFFECTED IN THIS MANNER, THE LOOP ALSO DEMONSTRATES THE MOBILITY OF THE NEGATIVE CHARGE.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

PROBLEMS IN ELECTROSTATICS 4 MIN

PRESENTS FOUR INTERESTING ELECTROSTATIC PHENOMENA, EACH OF WHICH CAN BE EXPLAINED BY A STUDENT WHO HAS ASSIMILATED THE MATERIAL PRESENTED IN THE OTHER LOOPS OF THE ELECTROSTATICS SERIES.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

PUTTING FREE ELECTRONS TO WORK 9 MIN

SHOWS HOW ELECTRONS CAN BE MADE TO LEAVE THE SURFACE OF A METAL, AND HOW THEY CAN BE ATTRACTED TOWARD A POSITIVELY CHARGED PLATE--AS IN THE DIODE RADIO TUBE. CONTROL OF THIS MOVEMENT BY A GRID--IN THE TRIODE TUBE--IS EXPLAINED, AND THE USES OF TUBE INDICATED.
PROD-EDA 16 BW
DIST-EDA RE SOUND 1960

SERIES AND PARALLEL CIRCUITS 10MIN

EXPLAINS RELATIONSHIP BETWEEN RESISTANCE, CURRENT AND VOLTAGE IN SERIES AND PARALLEL CIRCUITS. INCLUDES PROBLEMS.
PROD-EBF 16 BW
DIST-EBF RE SOUND 1943

STATIC ELECTRICITY (DANISH) 7 MIN

ANIMATED. EXPLANATION OF STATIC ELECTRICITY.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1957

STATIC ELECTRICITY--INDUCTION 9 MIN

SEPARATION OF CHARGES IS DEMONSTRATED WITH A SIMPLE EXPERIMENT AND ANIMATED SEQUENCES. INFORMATION USED TO EXPLAIN HOW CHARGES ARE IDENTIFIED AND MEASURED WITH AN ELECTROSCOPE.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1962

THERMIONIC EMISSION OF ELECTRONS 6 MIN

CURRENT IS OBSERVED IN A DIODE WHEN THE FILAMENT IS HEATED WITH A POSITIVE PLATE POTENTIAL--THE PLATE ALSO GETS RED-HOT. NO CURRENT IS DETECTED WITH POTENTIAL REVERSED.
COLLABORATOR--A. P. FRENCH
PROD-EDC 16 COLOR SERIES-EE
DIST-SET B RE SOUND 1965

TRANSFER AND DISTRIBUTION OF CHARGE 4 MIN

CHARGED PROBE IS CHECKED BY ELECTROSCOPE, TOUCHED TO METALLIC SPHERE, RECHECKED. SAME PROCEDURE IS FOLLOWED AGAIN, BUT PROBE IS INSERTED INTO THE HOLLOW SPHERE. ANIMATION ILLUSTRATES WHAT HAPPENS. FARADAY ICE PAIL EXPERIMENT.
PROD-LEPG 8,16 BW SERIES-LEPAGE
DIST-LEPG TC,RE 1966

TRANSISTORS--HIGH-FREQUENCY OPERATIONS--AMPLIFIERS AND OSCILLATORS 10MIN

DESCRIBES HOW TRANSISTORS OPERATE IN HIGH-FREQUENCY AMPLIFIERS AND IN OSCILLATOR CIRCUITS. SHOWS INFLUENCE OF TRANSIT EFFECTS IN BASE. EXPLAINS THE EFFECT OF COLLECTOR CAPACITANCE AND BASE RESISTANCE ON HIGH-FREQUENCY PERFORMANCE.
NOT AVAILABLE FOR SALE
PROD-USN 16 BW
DIST-BTL RE SOUND 1957

TRANSISTORS--MINORITY CARRIERS 10MIN

INTRODUCES PRINCIPLE OF MINORITY CARRIERS, SHOWS HOW THEY PRODUCE SMALL REVERSE CURRENT, DEMONSTRATES LIMITATIONS THEY IMPOSE ON TRANSISTOR BEHAVIOR WHEN TRANSISTOR IS HEATED OR LOADED.
PROD-USN 16 BW
DIST-DUART RE SOUND

VACUUM TUBE IN RADIO 10MIN

THREE FUNCTIONS OF THE VACUUM TUBE IN A RADIO ARE EXPLAINED--AS AMPLIFIER, RECTIFIER, OSCILLATOR.
PROD-EBF 16 BW
DIST-EBF RE SOUND

WHAT IS ELECTRICITY (DANISH) 5 MIN

ANIMATED. EXPLAINS THAT AN ATOM OUTWARDLY SEEMS UNELECTRICAL IF IT CONTAINS AN EVEN NUMBER OF POSITIVE CHARGES AND NEGATIVE ELECTRONS. IF THERE IS AN EXCESS OR A DEFICIT OF ONE ELECTRON THE ATOM BECOMES A NEGATIVE OR POSITIVE ION.
PROD-DANSK 16 BW
DIST-SFC RE SILENT 1957

Optics and Waves

AT AN APERTURE (FIXED WAVELENGTH) 4 MIN

DEMONSTRATES OPTICAL DIFFRACTION AT A SLIT IN RIPPLE TANK--NARROW APERTURE - TWO NARROW APERTURES - WIDE APERTURE - APERTURE VARIED.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1964

AT AN APERTURE (WAVELENGTH VARIED) 1 MIN

DEMONSTRATES OPTICAL DIFFRACTION AT A SLIT IN RIPPLE TANK--WAVELENGTH SHORT - WAVELENGTH DOUBLED - WAVELENGTH TREBLED.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1964

AT A NARROW OBSTACLE 1 MIN

SHOWS OPTICAL DIFFRACTION AT A PIN AND DIFFRACTION AT AN OBSTACLE IN A RIPPLE TANK.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1964

AT A STRAIGHT EDGE 1 MIN

SHOWS OPTICAL DIFFRACTION IN RIPPLE TANK AT AN EDGE.
COLLABORATOR-- W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1964

BARRIER PENETRATION 8 MIN

WIDE CHANNEL OF DEEP WATER BETWEEN TWO SHALLOW REGIONS IN THE RIPPLE TANK ACTS AS BARRIER TO A WAVE INCIDENT FROM ONE OF THE SHALLOW REGIONS. AS CHANNEL IS NARROWED, REFLECTION DIMINISHED AND TRANSMISSION ACROSS THE CHANNEL INCREASES.
CHANNEL INCREASES.
PROD-EDC 16 BW SERIES-RTWP
DIST-SET B RE SOUND

BARRIER PENETRATION BY WAVES 2 MIN

A WIDE CHANNEL OF DEEP WATER BETWEEN TWO SHALLOW REGIONS ACTS AS FINITE BARRIER TO WAVE INCIDENT FROM ONE OF THE SHALLOW REGIONS. INCIDENT WAVE IS TOTALLY REFLECTED. AS CHANNEL IS NARROWED, REFLECTION DIMINISHES AND TRANSMISSION ACROSS CHANNEL INCREASES.
COLLABORATOR-- JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

BEATS 1 MIN

TWO WAVES HAVING THE SAME AMPLITUDE AND VELOCITY, AND WITH FREQUENCIES IN THE RATIO 8/9, ARE ADDED. THE RESULTANT AMPLITUDE CHANGES WITH CHANGING PHASE DIFFERENCE. THE FACT THAT THE WAVE VELOCITY OF THE COMPONENTS IS THE SAME AS THE VELOCITY WITH WHICH THE NODE MOVES ACROSS THE SCREEN MAY BE VERIFIED BY MEASUREMENT.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

BEATS, THE (FRENCH) 7 MIN

COMBINES TWO SINUSOIDAL MOVEMENTS. THE CASE OF TWO PENDULA OF FREQUENCIES CLOSE TO EACH OTHER. PRINCIPLE OF SUPERPOSITION OF SMALL MOVEMENTS. GRAPHICAL ANALYSIS. PERIODICAL CHARACTER OF BEATS. THE PHASES OF THE GENERATING MOVEMENTS.
PROD-EDITA 16 BW
DIST-EDITA RE SILENT 1946

BRAGG REFLECTION 10MIN

WAVES ARE SCATTERED FROM A TWO-DIMENSIONAL ARRAY OF SMALL OBJECTS PRODUCING A STRONG REFLECTION AT THE ANGLE DEFINED BY 2D SIN C = NY. THE STRONG REFLECTION DISAPPEARS AS WAVELENGTH AND ANGLE OF INCIDENCE ARE VARIED.
PROD-EDC 16 BW SERIES-RTWP
DIST-SET B RE SOUND

BRAGG REFLECTION OF WAVES 2 MIN

WAVES PROPAGATE THROUGH A TWO-DIMENSIONAL LATTICE OF PEGS. CONSTRUCTIVE INTERFERENCE OF SCATTERED COMPONENTS APPEARS AT THE BRAGG ANGLE. CONTINUOUS VARIATION OF WAVELENGTH REVEALS A SECOND SCATTERING MAXIMUM AT HALF THE ORIGINAL WAVELENGTH.
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

CHANGE OF FREQUENCY 1 MIN

DEMONSTRATES INTERFERENCE PATTERN IN A RIPPLE TANK WHEN FREQUENCY OF ONE SOURCE IS INCREASED TO GIVE BEATS.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1962

CHANGE OF PHASE 1 MIN

DEMONSTRATES INTERFERENCE PATTERN OF ONE SOURCE IN A RIPPLE TANK, PUT OUT OF PHASE AT INTERVALS.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1962

CIRCULAR WAVE REFLECTION FROM VARIOUS BARRIERS 4 MIN

CIRCULAR PULSES ARE REFLECTED BY STRAIGHT BARRIER. ANIMATED SOURCE BEHIND BARRIER GENERATES IMAGE PULSE SIMULTANEOUSLY WITH REAL PULSE. EXPANDING IMAGE PULSE COINCIDES WITH REAL REFLECTED PULSE. CIRCULAR PULSES GENERATED IN CENTER OF CIRCULAR BARRIER ARE REFLECTED AND CONVERGE BACK TO ORIGIN. PULSES ARE GENERATED AT SEVERAL POINTS ALONG MAJOR AXIS OF ELLIPTICAL BARRIER.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

COCK WITH MIRROR IMAGE 4 MIN

INTRODUCTION TO THE STUDY OF IMAGES.
SHOWS A COCK IN FRONT OF A LARGE VERTICAL MIRROR, AT FIRST CLOSE-UP SO THAT THE EDGES OF THE MIRROR ARE NOT VISIBLE. THE COCK IS PUZZLED BY HIS IMAGE, BECOMES UNEASY, AND FINALLY FIGHTS WITH IT.
PROD-UNESCO 8 BW SERIES-FPB
DIST-UNESCO TC TN 1964

COLOR QUALITY OF LIGHT IN PHOTOGRAPHY 10MIN

EXPLAINS CONCEPT OF COLOR TEMPERATURE - USES ANIMATION TO ILLUSTRATE THE MEASURING OF A LIGHT SOURCE--CONSIDERS REFLECTED LIGHT, DESCRIBES VARIETY AND USE OF FILTERS.
PROD-THORNE 16 COLOR
DIST-THORNE RE SOUND 1966

DIFFRACTION--DOUBLE SLIT 4 MIN

THE SLIT SEPARATION IS VARIED, HOLDING THE WAVELENGTH CONSTANT - THE WAVELENGTH IS VARIED, HOLDING THE SEPARATION CONSTANT.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1962

DIFFRACTION--SINGLE SLIT 3 MIN

THE SLIT WIDTH IS VARIED, HOLDING THE WAVELENGTH CONSTANT - THE WAVELENGTH IS VARIED, HOLDING THE SLIT WIDTH CONSTANT.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1962

DIFFRACTION AND SCATTERING AROUND OBSTACLES 3 MIN

PLANE WAVES IN A RIPPLE TANK ARE DIFFRACTED FROM EDGE OF A STRAIGHT BARRIER AND FROM SEVERAL OBSTACLES. AS THE WAVELENGTH IS VARIED, A VARIETY OF SCATTERED WAVE FEATURES ARE DISPLAYED.
COLLABORATOR-- JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

DIFFRACTION AT AN APERTURE 3 MIN

SHOWS DIFFRACTION OF PLANE WAVES AT A SMALL OPENING, DIFFRACTION BY AN APERTURE A FEW WAVELENGTHS WIDE, AND DIFFRACTION AT A LARGE OPENING.
PROD-HB 8 COLOR SERIES-RT
DIST-EBF TC TN 1962

DOPPLER EFFECT 4 MIN

A PULSED AIR JET, PRODUCING PERIODIC CIRCULAR WAVES, MOVES OVER WATER AT 1/3 AND 2/3 OF WAVE VELOCITY, SHOWING DOPPLER EFFECT.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

DOPPLER EFFECT 8 MIN

EXPLAINS FACTORS WHICH DETERMINE PITCH OF A SOUND. WAVES SHOWN ADVANCING TOWARD LISTENER--(1) SOURCE AND LISTENER STATIONARY - (2) SOURCE IN MOTION, LISTENER STATIONARY - (3) SOURCE STATIONARY, LISTENER IN MOTION.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1960

DOPPLER EFFECT AND SHOCK WAVES 8 MIN

DEMONSTRATES PERIODIC WAVES MOVING AT VARIOUS SPEEDS WITH RESPECT TO THE WAVE MEDIUM. DOPPLER EFFECT SEEN WHEN SPEED IS LESS THAN WAVE VELOCITY - SHOCK WAVE AND CONE SEEN AT HIGHER SPEEDS.
PROD-EDC 16 BW SERIES-RTWP
DIST-SET B RE SOUND

EFFECT OF PHASE DIFFERENCES BETWEEN SOURCES 3 MIN

AT A GIVEN WAVELENGTH AND SOURCE SEPARATION, PHASE DIFFERENCE BETWEEN TWO SOURCES IS ALTERED SO THAT POSITIONS OF INTERFERENCE MAXIMA AND MINIMA ARE EXCHANGED. RIGHT HAND SOURCE IS THEN CONTINUOUSLY RETARDED, AND INTERFERENCE PATTERN SWEEPS CONTINUOUSLY ABOUT ORIGIN.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

FIELD OF VIEW 3 MIN

ANIMATION AND OVERHEAD SHOT OF A MAN SHOWING THE ANGLE THROUGH WHICH OUR EYES CAN RECEIVE AN IMAGE. THE BLIND ZONE. CORRESPONDING FIELD OF VIEW IN A BIRD. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

FOCUSING WAVES IN A RIPPLE TANK BY MEANS OF FRESNEL DIFFRACTION 7 MIN

PLANE WAVES ON WATER ARE BROUGHT INTO FOCUS BY MEANS OF A SET OF APERTURES RESEMBLING A FRESNEL ZONE PLATE.
PROD-UNESCO 16 BW SERIES-PPP
DIST-UNESCO RE SOUND

FOUR TELESCOPE ARRANGEMENTS 4 MIN

USING A RAY-STREAK BOARD, SHOWS THE NEWTONIAN AND CASSEGRAIN ARRANGEMENTS OF THE REFLECTING TELESCOPES. THE PRINCIPLE OF THE SCHMIDT CORRECTOR IS DEMONSTRATED AND A COMPARISON MADE ON THE RAY-STREAK BOARD BETWEEN A SPHERICAL AND A PARABOLIC REFLECTOR. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

FUNDAMENTALS OF ACOUSTICS 10MIN

VELOCITY OF SOUND, PHENOMENON OF REFRACTION, PHYSIOLOGICAL ASPECTS OF AUDITION, APPLICATION AND ABSORPTION OF SOUND BY WALLS.
PROD-EBF 16 BW
DIST-EBF RE SOUND

HARMONIC PHASORS 7 MIN

COMPUTER ANIMATED. SHOWS THE SYNTHESIS OF VARIOUS PERIODIC WAVES FROM SIMPLE SINUSOIDAL COMPONENTS.
COLLABORATOR--WILLIAM HUGGINS
PROD-EDC 16 BW
DIST-EDC RE SILENT 1965

INTERFERENCE 2 MIN

MECHANICAL DEMONSTRATION SHOWS HOW TWO WAVES CAN INTERFERE TO CANCEL OUT OR SUPPLEMENT ONE ANOTHER. INTERFERENCE IS SHOWN IN A RIPPLE TANK USING TWO SOURCES VIBRATING IN PHASE. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

INTERFERENCE 2 MIN

DEMONSTRATES INTERFERENCE AND SHOWS (THROUGH THE USE OF DIAGRAMS) THE PATTERN PRODUCED BY COMBINING THE WAVES FROM TWO SIMILAR GENERATORS.
PROD-HB 8 COLOR SERIES-RT
DIST-EBF TC TN 1962

INTERFERENCE AND DIFFRACTION--RIPPLE TANK WAVE PHENOMENA II 15MIN

VARIOUS INTERFERENCE PATTERNS PRODUCED BY TWO POINT SOURCES ARE DEMONSTRATED TO SHOW THE EFFECTS OF WAVELENGTH, PREPARATION OF THE SOURCE, AND PHASE.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8 BW SERIES-CFF
DIST-EDC FC TN 1962

INTERFERENCE OF WAVES 4 MIN

TWO SOURCES VIBRATING IN PHASE PRODUCE INTERFERENCE PATTERN. SOURCE SEPARATION IS DOUBLED WITHOUT CHANGING WAVELENGTH. WAVELENGTH IS DOUBLED WITHOUT CHANGING SOURCE SEPARATION. THEN WAVELENGTH IS CONTINUOUSLY DECREASED.
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

5

INVERSION OF IMAGE IN BULL'S EYE 4 MIN

AN ACTUAL BULL'S EYE IS CUT AND MOUNTED SO THAT WE CAN SEE HOW THE IMAGE OF THREE LIGHTS ARRANGED IN A TRIANGLE IS RECEIVED ON THE RETINA UPSIDE DOWN. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

LENSES 10MIN

USING PRISMS, SHOWS HOW LENSES REFRACT LIGHT. FORMATION AND CHARACTERISTICS OF IMAGES ARE DEMONSTRATED BY PLACING OBJECTS AT VARYING DISTANCES FROM THE FOCUS.
COLLABORATOR--C. W. BARNES

PROD-UWF 16 BW SERIES-LIGHT
DIST-UWF RE SOUND 1950

LIGHT AND PARTICLES I 5 MIN

SHOWS THE ANALOGY BETWEEN THE REFLECTION OF LIGHT AND THAT OF MOVING PARTICLES, REINFORCING THE PARTICLE MODEL FOR LIGHT. THE EXPERIMENTS ARE DONE WITH A FLAT SURFACE AND A PARABOLIC SURFACE.

PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

LIGHT AND PARTICLES II 5 MIN

SHOWS THAT A SMALL SPHERE THROWN AGAINST AN ELLIPTIC MIRROR FROM ONE OF THE FOCI GOES THROUGH THE OTHER FOCUS AFTER BEING REFLECTED. SIMILARLY, A BEAM OF LIGHT DIVERGING FROM ONE OF THE FOCI CONVERGES ON THE OTHER FOCUS AFTER REFLECTION.

PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

LIGHT PATH THEOREM, THE 3 MIN

ANIMATED. ILLUSTRATES THAT ''ANGLE OF INCIDENCE EQUALS ANGLE OF REFLECTION'' FOLLOWS FROM THE HYPOTHESIS THAT LIGHT TRAVELS BY THE SHORTEST ROUTE.

PROD-GATE 8 COLOR
DIST-GATE TC TN

LIGHT WAVES AND THEIR USES 10MIN

ILLUSTRATES PRINCIPLES OF REFLECTION WITH REFERENCE TO PLANE, CONCAVE AND CONVEX MIRRORS - REFRACTION WITH SPECIAL REFERENCE TO HUMAN EYE - INTERFERENCE, POLAR SCREENS, ELECTROMAGNETIC SPECTRUM, AND QUANTUM THEORY.

PROD-EBF 16 BW
DIST-EBF RE SOUND 1937

LIGHT, X-RAYS, GAMMA RAYS 4 MIN

THREE EXPERIMENTS ILLUSTRATE PROPERTIES OF THESE TYPES OF RADIATION--RECTILINEAR PROPAGATION, ABSORPTION, AND THE ABILITY TO BLACKEN A PHOTOGRAPHIC FILM. SEVERAL DIFFERENCES ALSO SHOWN.

PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

LONGITUDINAL NATURE OF SOUND WAVES 2 MIN

USING A LOUDSPEAKER, TABLE TENNIS BALL AND CANDLE, AND RECORDING WITH HIGH-SPEED PHOTOGRAPHY, THE CANDLE IS SEEN TO MOVE WITH THE LOUDSPEAKER CONE. SUMMARIZING ANIMATION INCLUDED. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

LONGITUDINAL WAVES (PROD-GATE) 2 MIN

A LINE OF DYNAMIC TROLLEYS SIMULATES THE MOTION OF AIR IN FRONT OF A LOUDSPEAKER. COMPARISON IS MADE WITH THE SPRINGINESS OF THE AIR IN A BICYCLE PUMP. SUMMARIZING ANIMATION COMPARES LONGITUDINAL AND TRANSVERSE WAVES. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

LONGITUDINAL WAVES (PROD-TECH) 2 MIN

ILLUSTRATES THE PROPAGATION AND CHARACTERISTICS OF LONGITUDINAL WAVES BY WORKING MODELS.

PROD-TECH 8 COLOR
DIST-EFVA TC TN 1962

LONGITUDINAL WAVE WITH DISPLACEMENT FUNCTION 1 MIN

A ''SOURCE'' PRODUCES A SINUSOIDAL COMPRESSIONAL WAVE. THE LOWER HALF OF THE DIAGRAM SHOWS HOW A LONGITUDINAL WAVE IS REPRESENTED GRAPHICALLY IN THE SAME MANNER AS A TRANSVERSE WAVE.

PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

LONGITUDINAL WAVE WITH PRESSURE FUNCTION 1 MIN

A SINUSOIDAL COMPRESSIONAL WAVE IS PRODUCED - THE CURVE BELOW IT SHOWS THE PRESSURE VARIATIONS.

PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

MEASUREMENT OF THE SPEED OF LIGHT 8 MIN

ANIMATED. DEPICTS THREE METHODS TO DETERMINE SPEED OF LIGHT--FIZEAU'S PLOTTED WHEEL, FOUCALT'S ROTATING, TWO-SIDED MIRROR AND MICHELSON'S ROTATING, MANY-SIDED MIRROR.
COLLABORATOR--AAPT

PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1952

MEASURING THE SPEED OF LIGHT 5 MIN

THE ACTUAL APPARATUS IS USED WITH ANIMATION TO SHOW THE PRINCIPLE INVOLVED IN ONE METHOD OF MEASURING THE SPEED OF LIGHT. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

MICHELSON INTERFEROMETER 4 MIN

SHOWS ADJUSTMENT OF MIRRORS, MONOCHROMATIC AND WHITE-LIGHT FRINGES, AND DISPLACEMENT OF FRINGES WHEN THIN FILM IS INSERTED. THE MACH-ZEHNDER INTERFEROMETER.

PROD-MILLER 8,8S,16 COLOR SERIES-CP
DIST-EFL TC,RE TN 1963

MICROWAVES 5 MIN

THE LENGTH OF THREE CENTIMETER WAVES IS MEASURED BY ANALOGY WITH MECHANICAL WATER WAVES ON A RIPPLE TANK, USING THE PHENOMENON OF INTERFERENCE. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

MODELS OF REFLECTION AND REFRACTION 4 MIN

ANALOGIES OF REFLECTION AND REFRACTION USING BALLS ROLLING ON APPROPRIATE SURFACES. COMPARISON WITH THE ACTUAL PHENOMENA. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

MOVEMENT OF TWO SOURCES 1 MIN

DEMONSTRATES INTERFERENCE PATTERN OF WAVES FROM TWO SOURCES IN A RIPPLE TANK WITH MOVEMENT OF BOTH SOURCES AND OF ONE ALONE.
COLLABORATOR--W. LLOWARCH

PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1962

MULTIPLE SLIT DIFFRACTION 3 MIN

INTERFERENCE PATTERN FROM TWO NARROW SLIT SOURCES IS SHOWN TO BE SIMILAR TO THAT PRODUCED BY TWO POINT SOURCES. IN BOTH CASES, THE SAME WAVELENGTH IS USED AND THE SOURCE SEPARATION EQUALS THE SLIT SEPARATION. USING 2, 3, 4, AND 8 NARROW SLITS, INTERFERENCE MAXIMA ARE SHOWN TO BECOME DIRECTIONAL BEAMS WITH LOW DIVERGENCE.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

NONRECURRENT WAVEFRONTS 3 MIN

TIDAL WAVES - SHOCK WAVE FROM NUCLEAR BOMB - DISTURBANCE SPREADING THROUGH CROWD OF PEOPLE - SPREADING PULSE OF LIGHT FROM A NOVA REFLECTED BY NEARBY CLOUD OF INTERSTELLAR GAS.
PROD-MILLER 8,16 BW SERIES-DP
DIST-EFL TC,RE TN 1963

OPPOSITE VELOCITIES AND DIFFERENT FREQUENCIES 1 MIN

SHOWS WHAT HAPPENS WHEN TWO WAVES ARE ADDED WHICH SATISFY EVERY REQUIREMENT FOR A STANDING WAVE EXCEPT THAT THEIR FREQUENCIES ARE UNEQUAL. SINCE THE WAVELENGTH OF ONE IS TWICE THAT OF THE OTHER, THE 2/1 SHAPE OF SUM OF TWO WAVES OF DIFFERENT FREQUENCY RESULTS, BUT IN THIS CASE THE PHASES CHANGE TO EXHIBIT ALL POSSIBLE PHASE DEPENDENT SHAPES.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

PARTIAL STANDING WAVE 1 MIN

WHEN THE TWO COMPONENTS OF A STANDING WAVE HAVE DIFFERENT AMPLITUDES, THE PARTICLES AT NODES EXECUTE A RESIDUAL MOTION. THE STANDING WAVE RATIO CONCEPT MAY BE ILLUSTRATED BY ACTUAL MEASUREMENT OF THE MAXIMUM AMPLITUDE AND THE AMPLITUDE AT THE NODES.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

PARTICLES 2 MIN

SHOWS EMISSION SPECTRA OF SODIUM, HYDROGEN, HELIUM. DESCRIBES APPARATUS. EMISSION OF PARTICLES.
PROD-HB 8 COLOR
DIST-EBF TC TN 1963

PINHOLE CAMERA 3 MIN

SHOWS THE USE OF THE PINHOLE CAMERA FOR IMAGE FORMATION, BOTH VISUAL AND PHOTOGRAPHIC. SHOWS THAT AS THE PINHOLE GETS SMALLER, THE PICTURES BECOME SHARPER, UP TO A CERTAIN POINT--THE TWO SMALLEST PINHOLES SHOW CONSIDERABLE BLURRING DUE TO DIFFRACTION.
PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

PLANE AND SPHERICAL WAVES--DIFFRACTION AT OBSTACLES 2 MIN

SHOWS SPHERICAL PROGRESSIVE WAVES FROM A GENERATOR, PLANE PROGRESSIVE WAVES, AND DIFFRACTION OF PLANE WAVES AROUND OBSTACLES SMALL AND LARGE WITH RESPECT TO THE WAVELENGTH.
PROD-HB 8 COLOR SERIES-RT
DIST-EBF TC TN 1962

PLUCKED STRINGS 5 MIN

ANIMATES TWO STANDARD DIAGRAMS ILLUSTRATING PARTICULAR SOLUTIONS OF THE WAVE EQUATION IN ONE DIMENSION.
COLLABORATOR--TREVOR FLETCHER
PROD-NFBC 16 BW
DIST-NFBC RE SILENT 1954

PROBLEM IN DIFFRACTION, A 4 MIN

NO INFORMATION AVAILABLE.
PROD-CHEM 8
DIST-CHEM TC TN

PROGRESSIVE WAVES--TRANSVERSE AND LONGITUDINAL 9 MIN

VELOCITY OF PULSE DOWN STRETCHED ROPE SHOWN TO DEPEND ON ELASTIC AND INERTIAL FACTORS. WAVELENGTH AND FREQUENCY OF STEADY WAVE PROPAGATION ALONG STRETCHED STRING IDENTIFIED AND RELATED. SAME TREATMENT FOR WAVE MOVING DOWN A ROW OF BEADS CONNECTED BY LIGHT SPRINGS.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1954

RECTILINEAR PROPAGATION 5 MIN

SHOWS PARTICLE BEHAVIOR OF LIGHT IN FOUR EXPERIMENTS ON THE FORMATION OF SHADOWS--WITH LIGHT, DROPLETS OF PAINT IN A SPRAY-JET, ALUMINUM ATOMS EVAPORATED (AND CONDENSED) IN VACUUM, AND ELECTRONS IN A CROOKES' TUBE.
PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

REFLECTED LIGHT--GLASS IN LIQUIDS 2 MIN

BITS OF BROKEN GLASS, CLEARLY VISIBLE IN AIR, BECOME LESS VISIBLE IN WATER, AND INVISIBLE IN A LIQUID OF THE SAME REFRACTIVE INDEX AS THE GLASS. SHOWS THAT THE INTENSITY OF LIGHT REFLECTED AT THE BOUNDARY BETWEEN TWO TRANSPARENT, COLORLESS MEDIA IS HIGHER WHEN THE DIFFERENCE BETWEEN THE REFRACTIVE INDICES IS GREATER, AND THAT NO LIGHT IS REFLECTED WHEN THE INDICES ARE EQUAL.
PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

REFLECTION AT PLANE AND CURVED SURFACES 3 MIN

SHOWS REFLECTION AT PLANE AND CURVED SURFACES, AND REFLECTION AT A CONCAVE SURFACE.
PROD-HB 8 COLOR SERIES-RT
DIST-EBF TC TN 1962

REFLECTION OF WAVES FROM CONCAVE BARRIERS 4 MIN

CIRCULAR PULSES ARE GENERATED AT SEVERAL POINTS ALONG AXIS OF PARABOLIC BARRIER. WITH SOURCE AT FOCUS OF PARABOLA, REFLECTED PULSE IS STRAIGHT. CIRCULAR PULSE IS ALSO GENERATED AT FOCUS OF SEMI-CIRCULAR BARRIER. USING STRAIGHT INCIDENT PULSE ON PARABOLIC BARRIER, ALL PARTS OF REFLECTED PULSE CONVERGE AT FOCUS.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

REFRACTION (PROD-HB) 4 MIN

USING PLANE PROGRESSIVE WAVES, REFRACTION AT A PLANE INTERFACE, REFRACTION BY A TRIANGULAR PRISM, AND REFRACTION BY A LENS ARE SHOWN.
PROD-HB 8 COLOR SERIES-RT
DIST-EBF TC TN 1962

REFRACTION (PROD-UWF) 8 MIN

LAW OF REFRACTION AND ITS APPLICATIONS ARE EXPLAINED AND DEMONSTRATED BY MEANS OF THE SUBMARINE PERISCOPE AND BINOCULARS.
COLLABORATOR--C. W. BARNES
PROD-UWF 16 BW SERIES-LIGHT
DIST-UWF RE SOUND 1950

REFRACTION OF LIGHT

AN OPTICAL DISC IS USED TO SHOW THE REFLECTION AND REFRACTION OF LIGHT AT THE BOUNDARY BETWEEN TWO MEDIA.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

REFRACTION OF WAVES 3 MIN

SHOWS THAT WAVE VELOCITY AND WAVELENGTH DECREASE AS WAVE CROSSES BOUNDARY FROM DEEP TO SHALLOW WATER. WHEN PERIODIC WAVE IS INCIDENT AT AN ANGLE TO THE BOUNDARY, WAVE FRONTS BEND, CHANGING DIRECTION OF PROPAGATION. WHEN THE ANGLE OF INCIDENCE IS INCREASED TO CRITICAL ANGLE, REFRACTED WAVE RUNS PARALLEL TO BOUNDARY. A FURTHER INCREASE PRODUCES TOTAL REFLECTION.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

RESOLVING POWER 3 MIN

PINHOLE SOURCE IS VIEWED THROUGH TELESCOPE OF VARIABLE APERTURE. THE RAYLEIGH CRITERION IS DEMONSTRATED WITH TWO PINHOLE SOURCES.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

SIMPLE HARMONIC MOTION (PROD-HEIL) 1 MIN

POINT MOVES IN UNIFORM CIRCULAR MOTION, WITH ITS PROJECTION MOVING IN SIMPLE HARMONIC MOTION ON THE DIAMETER OF THE CIRCLE. SHOWS POINTS OF MAXIMUM AND MINIMUM VELOCITY AND ACCELERATION. EXPLAINS DISPLACEMENT, AMPLITUDE AND PERIOD.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

SINGLE SLIT DIFFRACTION 4 MIN

INITIAL WAVELENGTH IS APPROXIMATELY EQUAL TO SLIT WIDTH. HOLDING SLIT WIDTH CONSTANT, WAVELENGTH IS DECREASED TO 1/4 ITS INITIAL VALUE AND THEN RESTORED. WAVELENGTH, THEN AT CONSTANT SLIT WIDTH IS INCREASED. POSITIONS OF NODES AND MAXIMA IN DIFFRACTION PATTERN ARE SEEN TO DEPEND ON BOTH VARIABLES.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

SOUND WAVES AND THEIR SOURCES 10MIN

ILLUSTRATES CONCEPTS OF AMPLITUDE, FREQUENCY, WAVELENGTH.
PROD-EBF 16 BW
DIST-EBF RE SOUND 1933

SPEED OF A PULSE IN A STRETCHED ROPE, THE 8 MIN

A PULSE IS SENT ALONG SPIRAL SPRING UNDER SLIGHT TENSION AND SPEED OF PROPAGATION OBSERVED. SHOWS THAT THE SPEED OF PROPAGATION OF A TRANSVERSE PULSE ON A STRETCHED ROPE DEPENDS ON THE SQUARE ROOT OF THE TENSION.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

SPHERICAL MIRRORS 10MIN

NO INFORMATION AVAILABLE.
PROD-UWF 16
DIST-UWF RE SOUND

STANDING WAVE 1 MIN

THE COMPONENT WAVES OF SUM OF TWO IDENTICAL WAVES ARE GIVEN OPPOSITE VELOCITIES AND THE FAMILIAR STANDING WAVE APPEARS AS THE RESULTANT. TWO NODES A WAVELENGTH APART ARE MARKED.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

STATIONARY LONGITUDINAL WAVES 9 MIN

PULSE AND STEADY TRAIN OF WAVES SHOWN ON STRING OF BEADS CONNECTED BY LIGHT SPRINGS.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1953

STATIONARY TRANSVERSE WAVES 9 MIN

PULSE REFLECTION AND PHASE CHANGE STUDIED AT THE FIXED END OF A STRETCHED STRING. CONCLUSIONS ARE APPLIED TO REFLECTION OF STEADY WAVE-TRAIN AT A STRING BOUNDARY. NODES AND ANTI-NODES ARE IDENTIFIED AND POSITIONS RELATED TO WAVELENGTH.
COLLABORATOR--AAPT
PROD-AP 16 BW SERIES-PHYS
DIST-MGHT RE SOUND 1954

STRAIGHT WAVE REFLECTION FROM STRAIGHT BARRIERS 3 MIN

SINGLE STRAIGHT PULSES ARE REFLECTED FROM A STRAIGHT BARRIER FOR SEVERAL ANGLES OF INCIDENCE. SHOWS ANGLE OF INCIDENCE EQUALS ANGLE OF REFLECTION. CONTINUOUS PERIODIC WAVE IS REFLECTED FROM 45 DEGREE BARRIER, AND REFLECTED WAVE MOVES OFF AT RIGHT ANGLE TO DIRECTION OF INCIDENT WAVE.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

SUM OF TWO IDENTICAL WAVES 1 MIN

TWO WAVES HAVING THE SAME FREQUENCY, AMPLITUDE, AND VELOCITY, AND IN PHASE AGREEMENT, PASS ACROSS THE TOP OF THE FRAME. THE RESULT IS A WAVE EXACTLY LIKE ITS COMPONENTS WITH TWICE THE AMPLITUDE OF EITHER.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

SUM OF IDENTICAL WAVES NOT IN PHASE AGREEMENT 1 MIN

TWO WAVES, OF THE SAME AMPLITUDE BUT DIFFERING IN PHASE BY 120 DEGREES, ARE ADDED. THE RESULTANT IS A WAVE OF THE SAME AMPLITUDE AS EITHER COMPONENT, LEADING ONE BY 60 DEGREES AND LAGGING THE OTHER BY THE SAME ANGLE.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

SUM OF TWO WAVES OF DIFFERENT FREQUENCY 1 MIN

TWO WAVES HAVING SAME VELOCITY AND AMPLITUDE AND FREQUENCIES IN RATIO 2/1 SHOW FAMILIAR WAVE-SHAPE ASSOCIATED WITH A MUSICAL NOTE AND ITS OCTAVE. THE WAVE FORM DOES NOT CHANGE AND HAS THE VELOCITY OF ITS COMPONENTS. PARTICLES IN THE COMPONENT WAVES EXECUTE SIMPLE HARMONIC MOTION. A PARTICLE IN THE RESULTANT WAVE EXECUTES A COMPLEX HARMONIC MOTION.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

SUPERPOSITION 4 MIN

COMPUTER ANIMATED. SUPERIMPOSES SINE CURVES. ON TWO TRACES ARE SHOWN TWO SEPARATE SINE CURVES, ON A THIRD, THEIR SUM. VARIOUS PHASE DIFFERENCES, WAVELENGTH RATIOS, ETC., ARE SHOWN.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-W
DIST-EBF TC,RE TN 1967

SUPERPOSITION OF PULSES 4 MIN

SINGLE PULSES ARE GENERATED FROM TWO SOURCES. THE PATHS TAKEN BY THE INTERSECTION OF BOTH PULSES ARE SUPERPOSED ON THE FILM. PULSES ARE FIRST GENERATED SIMULTANEOUSLY. RIGHT HAND PULSE IS PROGRESSIVELY DELAYED, AND INTERSECTION PATH BENDS INCREASINGLY TO THE RIGHT. MULTIPLE PULSES FROM TWO SOURCES BUILD UP TO PERIODIC WAVES--INTERFERENCE PATTERN IS SEEN.
COLLABORATOR--JAMES STRICKLAND
PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

TELEPHOTO LENS, THE — 3 MIN

ANIMATION AND A SMOKE-BOX DEMONSTRATION SHOW THE PRINCIPLE INVOLVED. A NEWS SHOT SHOWS THE EFFECT. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

TRANSVERSE WAVES (PROD-GATE) — 5 MIN

USING LONG LINES OF LINKED DYNAMIC TROLLEYS, EFFECTS OF CHANGING THE MASS OF THE TROLLEYS AND THE TENSION BETWEEN THEM ARE SHOWN, WITH SUMMARIZING ANIMATION. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

TRANSVERSE WAVES (PROD-TECH) — 2 MIN

ILLUSTRATES THE PROPAGATION OF TRANSVERSE WAVES AND EXPLAINS THEIR CHARACTERISTICS BY WORKING MODELS.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1962

TRANSVERSE WAVES, SAME FREQUENCY — 1 MIN

TWO WAVES MOVE WITH DIFFERENT VELOCITY BUT HAVE THE SAME FREQUENCY.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

TRANSVERSE WAVES, SAME VELOCITY — 1 MIN

TWO PROGRESSIVE SINE WAVES OF DIFFERENT WAVELENGTH MOVE ACROSS THE SCREEN WITH EQUAL VELOCITY. THE MEANING OF WAVELENGTH, FREQUENCY, VELOCITY, DISPLACEMENT AMPLITUDE, AND PHASE ARE CLARIFIED.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

TWO EXPERIMENTS WITH IMAGES — 5 MIN

(1) EXTERNAL MOVING OBJECTS ARE VIEWED THROUGH A TELE-KALEIDOSCOPE (THREE MIRRORS AND A LENS) - MOVING PATTERNS SHOW VARIOUS SYMMETRIES. (2) A TRANSPARENT BOTTLE FILLED WITH WATER (A CYLINDRICAL LENS) IS FIRST HELD VERTICALLY AND THEN ROTATED AROUND A HORIZONTAL AXIS. THE IMAGE SEEN THROUGH THE LENS ROTATES BY AN ANGLE EQUAL TO TWICE THAT OF THAT BOTTLE.
PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

TWO SOURCES IN PHASE — 1 MIN

USING SCHLIEREN TECHNIQUE IN RIPPLE TANK, DEMONSTRATES STEADY INTERFERENCE PATTERN OF WAVES FROM TWO SOURCES.
COLLABORATOR--W. LLOWARCH
PROD-GATE 8 BW SERIES-WAVE-G
DIST-ICF TC TN 1962

VELOCITY, FREQUENCY AND WAVELENGTH — 1 MIN

FACILITATES UNDERSTANDING OF RELATIONSHIP V = FREQUENCY X WAVELENGTH. A PARTICLE IN A WAVE TRAIN IS INDICATED BY A REFERENCE CIRCLE. A SINGLE CYCLE IS TIMED AND A SINGLE WAVELENGTH IS PROJECTED ONTO A BLACKBOARD.
PROD-HEIL 16 BW SERIES-WAVE-H
DIST-WELCH RE SILENT

VIBRATIONS (FRENCH) — 10MIN

GRAPHICAL ANALYSIS OF THE SINUSOIDAL MOTION. PRINCIPLE OF SMALL MOTIONS AND CONSTRUCTION OF THE RESULTING MOTION. PRINCIPLE OF SMALL MOTIONS AND CONSTRUCTION OF THE RESULTING MOTION. THE CASE OF TWO MOTIONS OF IDENTICAL PERIODS. CONDITIONS FOR THE GENERATION OF STANDING WAVES.
PROD-CDC 16 BW
DIST-CDC RE SILENT 1957

VIBRATIONS OF A DRUM — 4 MIN

A MODEL DRUM IS DRIVEN BY A LOUDSPEAKER FROM AN AUDIO-OSCILLATOR WHOSE FREQUENCY IS INCREASED CONTINUOUSLY FROM ZERO. SIX RESONANT MODES ARE CLEARLY VISIBLE AND THEN ARE FILMED STROBOSCOPICALLY TO SHOW THE GEOMETRY.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-W
DIST-EBF TC,RE TN 1967

VIBRATIONS OF A METAL PLATE — 4 MIN

THE NODAL LINES OF A SQUARE PLATE IN ITS MANY MODES ARE OUTLINED AS THE SAND COVERING THE PLATE FOLLOWS THE VIBRATIONS CREATED IN IT BY A LOUDSPEAKER.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-W
DIST-EBF TC,RE TN 1967

VIBRATIONS OF A RUBBER HOSE — 4 MIN

A 20-FOOT RUBBER HOSE IS ''DRIVEN'' FROM A VARIABLE SPEED MOTOR VIA ECCENTRIC DRIVE. THE FREQUENCY OF DRIVING IS VARIED CONTINUOUSLY BEGINNING FROM ZERO. THE ''STRING'' RESONATES FIFTEEN TIMES, RAISING QUESTIONS OF THE INFINITY OF MODES, OF RESONANCE, ETC.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-W
DIST-EBF TC,RE TN 1967

WAVE EQUATION, A — 4 MIN

USING A WAVE MACHINE AND ANIMATION, WAVE MOTIONS ARE ANALYZED AND THE RELATIONSHIP (SPEED = WAVELENGTH X FREQUENCY) SHOWN. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

WAVE MACHINE, A — 5 MIN

SHOWS THE NATURE OF A TRANSVERSE WAVE AND COMPARES IT WITH A WAVE IN A SLINKY SPRING. PULSE WAVES ARE COMPARED WITH CONTINUOUS WAVES - TRANSMISSION OF ENERGY BY THE WAVE MACHINE IS SHOWN. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

WAVE MOTION — 7 MIN

DEMONSTRATION OF INTERFERENCE PATTERNS ON THE SURFACE OF WATER USING THE SCHLIEREN TECHNIQUE.
COLLABORATOR--W. LLOWARCH
PROD-GATE 16 BW
DIST-GATE RE SOUND 1962

WAVES IN A STRING — 4 MIN

RELATION OF HARMONICS TO STRING TENSION.
PROD-LOEW 16 BW SERIES-PC
DIST-MGHT RE SOUND 1950

Atomic and Nuclear

ABSORPTION SPECTRA 4 MIN

A STUDY OF ABSORPTION SPECTRA AS OBSERVED IN SODIUM VAPOR, LIQUID HEMOGLOBIN AND OXYHEMOGLOBIN, AND SOLID DIDYMIUM GLASS.

PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

ADVANCED TEST REACTOR 9 MIN

ANIMATED. SHOWS AEC'S 250 MWT ADVANCED TEST REACTOR USES MULTIPLE FLUX TRAPS TO ACHIEVE HIGH NEUTRON DENSITY IN NINE INDEPENDENT TEST LOOP POSITIONS.

PROD-SET A 16 COLOR
DIST-BYRON RE SOUND 1964

ARGONNE FAST SOURCE REACTOR 9 MIN

GIVES INFORMATION ON REACTOR'S CORE AND ITS POSITIONING, TWO METHODS OF CHANGING REACTIVITY, THE COOLING SYSTEM, THE THERMAL COLUMN AND THE VARIOUS ACCESS-BEAM HOLES.

PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1960

ASTON'S MASS SPECTROGRAPH 2 MIN

AFTER SHOWING PICTURE AND DIAGRAMS OF THE SPECTROGRAPH, FOLLOWS A STREAM OF POSITIVE PARTICLES (NE 20) THROUGH THE SPECTROGRAPH EXPLAINING HOW THE BEAM IS BROUGHT TO A FOCUS AS THE MAGNETIC FIELD INCREASES AND HOW THE MASS SPECTRUM IS PRODUCED.

PROD-HB 8 COLOR
DIST-EBF TC TN 1963

ATMOSPHERIC DISTRIBUTION OF NUCLEAR FALLOUT 4 MIN

FALLOUT RATES, MONITORED BY VARIOUS METHODS, DEMONSTRATE TIME/DISTANCE RELATIONSHIPS BETWEEN ATMOSPHERIC, TROPOSPHERIC AND STRATOSPHERIC FALLOUT.

PROD-CENCO 8 COLOR SERIES-NR
DIST-ICF TC SILENT 1961

ATOMIC ENERGY 10MIN

EXPLAINS STRUCTURE OF THE ATOM, DESCRIBES PROCESS OF NUCLEAR SYNTHESIS, THE FISSION PROCESS, AND THE CHAIN REACTION.

PROD-EBF 16 BW
DIST-EBF RE SOUND 1950

ATOMIC THEORY, THE 10MIN

STARTING WITH DALTON'S BASIC THEORY, OUTLINES PROGRESS IN ATOMIC STUDY DURING THE 19TH CENTURY, INCLUDING FARADAY'S ELECTROLYSIS EXPERIMENTS AND MENDELEEV'S PERIODIC TABLE.

PROD-UWF 16 BW
DIST-UWF RE SOUND 1947

BETA RAY SPECTROMETER 7 MIN

EXPLAINS, THROUGH LIVE ACTION AND ANIMATION, THE PRINCIPLES AND OPERATION OF THE COINCIDENCE BETA RAY SPECTROMETER. COMPONENTS ARE ASSEMBLED, A SOURCE IS INTRODUCED AND MASKING FOR BEAM DIRECTION AND SIZE IS DEMONSTRATED.

PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1963

BIOLOGICAL EFFECTS OF NUCLEAR RADIATION 4 MIN

DEFINES ALPHA, BETA, GAMMA RADIATIONS. SHOWS EFFECT ON LIVING CELLS AND USES IN MEDICINE.

PROD-CENCO 8 COLOR SERIES-NR
DIST-ICF TC SILENT 1961

BUBBLE MODEL OF A CRYSTAL--DEFORMATION AND DISLOCATION 3 MIN

EXAMINES ELASTIC AND PLASTIC DEFORMATION OF METAL STRUCTURES. AS BUBBLE RAFT IS DEFORMED, DISLOCATIONS ARE EXAMINED WITH ANIMATION AND SUPERIMPOSED VECTOR DIAGRAMS.
COLLABORATOR--SIR LAWRENCE BRAGG

PROD-EFL 8,8S COLOR
DIST-EFL TC TN

BUBBLE MODEL OF A CRYSTAL--STRUCTURE AND BOUNDARIES 2 MIN

UTILIZES BUBBLE RAFTS TO SIMULATE A TWO-DIMENSIONAL CRYSTAL STRUCTURE. ANIMATION SUPERIMPOSED ON THE STRUCTURE REVEALS ANGLES MADE BY THE CRYSTAL PLANES AND THE DIFFERENT ORIENTATION OF THESE LINES IN NEIGHBORING CRYSTALS. CHANGING BOUNDARIES OBSERVED BY TIME-LAPSE PHOTOGRAPHY.
COLLABORATOR--SIR LAWRENCE BRAGG

PROD-EFL 8,8S COLOR
DIST-EFL TC TN

CHAIN REACTIONS, CONTROLLED AND UNCONTROLLED 3 MIN

USING FIRST STUDENTS, THEN DOMINOES, A CONTROLLED REACTION IS ILLUSTRATED, FOLLOWED BY A PICTURE OF A NUCLEAR REACTOR. USING THE SAME INITIAL SEQUENCE, AN UNCONTROLLED CHAIN REACTION IS ILLUSTRATED, FOLLOWED BY TWO PHOTOS OF A NUCLEAR EXPLOSION. CARTRIDGE ALSO CONTAINS ''REGELATION.''

PROD-NOR 8 BW
DIST-NOR TC

CHAIN REACTION--CONTROLLED CHAIN REACTION 3 MIN

ANIMATED. SHOWS VARIOUS STAGES OF A CHAIN REACTION AND OF A CONTROLLED CHAIN REACTION AROUND A U 235 NUCLEUS CLUSTER.

PROD-HB 8 COLOR
DIST-EBF TC TN 1963

CRITICAL SIZE 2 MIN

ANIMATED. DEMONSTRATES THE IMPORTANCE OF CRITICAL MASS IN THE CREATION OF A NUCLEAR REACTION SIMILAR TO THAT TAKING PLACE IN AN ATOMIC EXPLOSION.

PROD-HB 8 COLOR
DIST-EBF TC TN 1963

CROOKE'S TUBES 8 MIN

DEMONSTRATES THE EFFECT OF PRESSURE ON ELECTRICAL DISCHARGE IN GASES. VARIETY OF SPECIAL TUBES USED TO SHOW THE KINETIC ENERGY OF CATHODE RAYS, THE HEATING EFFECT, FLUORESCENCE, THEIR STRAIGHT-LINE TRAVEL AND DEFLECTION BY A MAGNETIC FIELD.

PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SILENT 1960

CRYSTALS AND THEIR STRUCTURES 22MIN

EXPERIMENTS IN RIPPLE TANKS ON AN UNKNOWN CRYSTALLINE ARRAY ARE PERFORMED SO THAT THE PRINCIPLES AND MEASUREMENTS BY WHICH ACTUAL CRYSTAL STRUCTURES ARE DETERMINED CAN BE SEEN.
COLLABORATOR--J. ARTHUR CAMPBELL
PROD-CHEM 8 BW
DIST-MLA FC TN

CRYSTALS AND X-RAY DIFFRACTION 4 MIN

NO INFORMATION AVAILABLE.
PROD-CHEM 8
DIST-CHEM TC TN

CRYSTAL STRUCTURE OF METALS 5 MIN

INTRODUCTION TO THE SIMPLE, BODY-CENTERED, AND FACE-CENTERED CUBIC SYSTEMS AND HEXAGONAL CLOSEST-PACKED SYSTEM INCLUDING TETRAHEDRAL AND OCTAHEDRAL SITES.
PROD-SLAB 8 COLOR
DIST-ACCC TC TN 1967

DIFFRACTION OF X-RAYS BY A CRYSTAL 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

ELECTRONS 10MIN

ILLUSTRATES ELECTROLYSIS OF A SILVER SALT AND OF WATER, THE NATURE OF THE ELECTRON, DETERMINATION OF THE MASS OF AN ELECTRON AND APPLICATION OF THE PHOTO-ELECTRIC CELL TO REPRODUCTION OF SOUND.
PROD-EBF 16 BW
DIST-EBF RE SOUND

ELECTRONS IN A UNIFORM MAGNETIC FIELD 10MIN

SPHERICAL CATHODE-RAY TUBE WITH A LOW GAS ATMOSPHERE IS USED TO MEASURE THE CURVATURE OF THE PATH OF ELECTRONS IN A MAGNETIC FIELD - MASS OF ELECTRON IS DETERMINED.
PROD-EDC 16 BW SERIES-PSSC
DIST-SET B RE SOUND 1958

FERROMAGNETIC DOMAIN WALL MOTION 4 MIN

MICROSCOPIC VIEW OF SINGLE-CRYSTAL IRON WHISKER IN VARYING LONGITUDINAL MAGNETIC FIELD.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

FIELD EMISSION OF ELECTRONS 4 MIN

SHOWS HOW ELECTRONS CAN BE DRAGGED OUT OF AN UNHEATED WIRE BY STRONG ELECTRIC FIELDS.
COLLABORATOR--A. P. FRENCH
PROD-EDC 16 BW SERIES-EE
DIST-SET B RE SOUND 1965

FOURIER ANALYSIS AND SYNTHESIS OF ELECTRON DENSITY IN CRYSTALS 10MIN

DEPICTS HOW THE TERMS OF A FOURIER SERIES CONTRIBUTE IN RECONSTITUTING THE DETAILS OF A TWO-DIMENSIONAL ELECTRON DENSITY PROJECTION.
NOT AVAILABLE FOR SALE
PROD-SET E 16 BW
DIST-SFRS RE SILENT 1962

FRACTURE OF SOLIDS, THE

A ROCK-SALT CRYSTAL IS SPLIT ALONG ONE OF ITS CLEAVAGE PLANES, AND THE RECTANGULAR FRACTURE OBSERVED. ANOTHER CRYSTAL, SPLIT AT AN ANGLE TO THE DIRECTIONS OF EASY CLEAVAGE, SHOWS IRREGULAR FRACTURE. SUGGESTS THE EXISTENCE OF PLANES OF ATOMS IN CRYSTALS.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

GASEOUS DIFFUSION 3 MIN

ANIMATED. ILLUSTRATES GASEOUS DIFFUSION METHOD OF SEPARATING U-235 FROM U-238.
PROD-LMAF 16 BW
DIST-LMAF RE SOUND 1958

GAUGING THICKNESS WITH RADIOISOTOPES 5 MIN

SHOWS HOW BETA GAUGES ARE USED FOR PRECISE MEASUREMENT AND CONTROL OF FEEDBACK APPARATUS IN STEEL, PLASTIC, RUBBER, AND PAPER MANUFACTURING.
PROD-TRESS 16 BW
DIST-BYRON RE SOUND 1958

GEIGER AND MARSDEN EXPERIMENT

NO INFORMATION AVAILABLE.
PROD-ECTHEN 8 COLOR
DIST- TC TN 1967

GEIGER COUNTER 7 MIN

OPERATING PRINCIPLES ARE EXPLAINED BY DIAGRAM AND ANIMATION, AND A RADIATION COUNTING EXPERIMENT IS DEMONSTRATED.
PROD-YALE 16 COLOR SERIES-YCP
DIST-AIM RE SILENT 1960

GROWTH OF CRYSTALS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEP
DIST-DIL TC TN 1966

HALF-LIFE

NO INFORMATION AVAILABLE.
PROD-EOTHEN 8 COLOR
DIST- TC TN 1967

HALF-LIFE OF A RADIOACTIVE COIN 4 MIN

SHOWS A PIECE OF IN-116 BEING IRRADIATED. HALF-LIFE EXPERIMENT IS CONDUCTED, HALF OF WHICH IS ON FILM AND THE REST OF WHICH (INCLUDING DATA) APPEARS IN NOTES FROM WHICH STUDENT PLOTS RESULTS.
PROD-NFBC 8,16 BW SERIES-IP-AN
DIST-EBF TC,RE TN,SN 1967

HIGH ENERGY PEOPLE, THE 5 MIN

DESCRIBES PROBLEMS AND TOOLS OF HIGH ENERGY PHYSICS, ILLUSTRATED BY WORK WITH THE ZERO GRADIENT SYNCHROTRON. SPARK CHAMBER ALSO SHOWN AND EXPLAINED.
PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1963

HIGH-SPEED PHOTOGRAPHY IN NUCLEAR REACTOR DEVELOPMENT 10MIN

EXAMPLES OF HIGH-SPEED MOTION PICTURES TAKEN DURING CHEMICAL REACTIONS OF URANIUM, HEAT-TRANSFER STUDIES, MECHANICAL COMPONENT ANALYSIS, SODIUM WATER REACTIONS, POWER TRANSIENTS IN REACTORS AT ARGONNE.
NOT AVAILABLE FOR SALE
PROD-ANL 16 COLOR
DIST-ANL RE SOUND 1960

HOW A THERMAL REACTOR WORKS 7 MIN

EXPLAINS THE OPERATION OF THE REACTOR AND HEAT EXCHANGERS AT CALDER HALL IN CUMBERLAND, ENGLAND.
NOT AVAILABLE FOR SALE
PROD-ACE 16 COLOR
DIST-NSFL RE SOUND 1956

HYDROGEN ATOM AS VIEWED BY QUANTUM MECHANICS-- ADVANCED VERSION, THE 20MIN

INCLUDES STANDARD VERSION PLUS CONTRASTING ELECTRON DISTRIBUTIONS OF 1S, 2S, AND 2P ORBITALS. PRINCIPAL QUANTUM NUMBER, N, IS INTRODUCED TOGETHER WITH ITS RELATION TO ENERGY LEVELS, NUMBER OF ORBITALS, AND NUMBER OF NODAL SURFACES.
COLLABORATOR--GEORGE C. PIMENTEL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

HYDROGEN ATOM AS VIEWED BY QUANTUM MECHANICS-- STANDARD VERSION, THE 13MIN

EXPLAINS THE ENERGY LEVELS IN HYDROGEN ATOM AND THE SPECTRUM LINES AND FURNISHES THE BASIS OF CONTEMPORARY THEORY OF CHEMICAL BONDING. ELECTRON POSITION IN ATOM IS CONSIDERED IN TERMS OF PROBABILITY AND THE MEANING OF A 1S ORBITAL IS CLARIFIED WITH A DIGITAL COMPUTER PLOT, TWO ANALOGIES, AND ANIMATION.
COLLABORATOR--GEORGE C. PIMENTEL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

IONIZATION ENERGY 22MIN

PRESENTS TWO METHODS OF MEASURING IONIZATION ENERGY--PHOTO-IONIZATION (OF SODIUM USING MERCURY LIGHT SOURCE AND MONOCHROMATOR) AND ELECTRON BOMBARDMENT (WITH SODIUM AND THREE INERT GASES SHOWING WHAT OCCURS ON THE ATOMIC LEVEL).
COLLABORATOR--BRUCE H. MAHAN
PROD-CHEM 8 COLOR
DIST-MLA FC TN

LIGHT AND ELECTRONS 4 MIN

FOUR EXPERIMENTS SHOWING ELECTRIC EFFECTS PRODUCED BY LIGHT (INCLUDING INVISIBLE LIGHT)--THAT LIGHT CAN EXPEL ELECTRONS FROM A METAL, THAT IT CAN CONTROL THE FLOW OF ELECTRONS IN A SOLID, AND THAT IT CAN GIVE RISE TO AN ELECTRIC VOLTAGE.
PROD-UNESCO 8 BW SERIES-PPB
DIST-UNESCO TC TN 1964

LORD RUTHERFORD ON ''THE ATOM'' 10MIN

EMINENT SCIENTIST SPEAKS WITH PRECISION AND CLARITY ON THE NATURE AND STRUCTURE OF THE ATOM.
PROD- 16 BW
DIST-IAEA RE SOUND 1935

MAGNETIC BOTTLE, THE 10MIN

DESCRIBES THE USE OF THE PINCH EFFECT AND MAGNETIC MIRROR MACHINES FOR THE CONTAINMENT OF PLASMA, AND SHOWS THE USE OF SUCH DEVICES FOR THE ACHIEVEMENT OF CONDITIONS WHERE FUSION CAN OCCUR.
NOT AVAILABLE FOR SALE
PROD-USIA 16 COLOR
DIST-AEC RE SOUND 1958

MEASURING THE HALF-LIFE OF IODINE-128 4 MIN

AN IODINE COMPOUND IS IRRADIATED IN A NEUTRON SOURCE. THE IODINE-128 PRODUCED IS EXTRACTED AND THE WAY ITS ACTIVITY DECAYS WITH TIME IS SHOWN. FROM THE RATE OF DECAY THE HALF-LIFE IS DEDUCED.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

MILLIKAN'S OIL DROP EXPERIMENT 6 MIN

SHOWS EXPERIMENT TO DETERMINE THE ELEMENTARY CHARGE ON AN ELECTRON. FORMULAS NECESSARY FOR ANALYSIS OF THE DATA ARE INCLUDED.
PROD-YALE 16 BW SERIES-YCF
DIST-AIM RE SILENT 1960

MOLECULAR MOTIONS 13MIN

DEMONSTRATES THAT TRANSLATIONAL, ROTATIONAL AND VIBRATIONAL MOLECULAR MOTIONS AFFECT OBSERVED PROPERTIES OF MATTER.
COLLABORATOR--J. ARTHUR CAMPBELL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

MOLECULAR MOTIONS 13MIN

DEMONSTRATES THAT TRANSLATIONAL, ROTATIONAL AND VIBRATIONAL MOLECULAR MOTIONS EFFECT OBSERVED PROPERTIES OF MATTER.
COLLABORATOR--J. ARTHUR CAMPBELL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

MOLECULAR SPECTROSCOPY 23MIN

USES LABORATORY EXPERIMENTS, MOLECULAR MODELS AND ANIMATION TO SHOW DETAILS OF THE INFRARED LIGHT ABSORPTION PROCESS AND ITS RELATION TO MOLECULAR PROPERTIES. STRESSES THE CONCEPT OF NATURAL VIBRATIONAL FREQUENCIES IN MOLECULES AND DEMONSTRATES USE OF THE INFRARED SPECTRUM TO IDENTIFY MOLECULES AND DETERMINE THEIR STRUCTURE.
COLLABORATORS--BRYCE CRAWFORD AND JOHN OVEREND
PROD-CHEM 8 COLOR
DIST-MLA FC TN

MOLECULAR VIBRATIONS--USING MODELS 4 MIN

NO INFORMATION AVAILABLE.
PROD-CHEM 8
DIST- TC

NEUTRON ACTIVATION 8 MIN

DESCRIBES THE GENERAL TECHNIQUES, APPLICATIONS AND SENSITIVITIES OF MEASURING ELEMENTS IN A SUBSTANCE IRRADIATED BY NEUTRONS.
PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1964

NEUTRON DIFFRACTION 9 MIN

DESCRIBES PRINCIPLES OF NEUTRON DIFFRACTION FOR THE DETERMINATION OF POSITIONS OF LIGHT ATOMS IN CRYSTAL STRUCTURE AND FOR THE STUDY OF MAGNETIC ORIENTATION.
PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1964

NUCLEAR RADIATION DETECTORS, PART I 4 MIN

SHOWS THE OPERATIONAL PRINCIPLES OF THE GOLDLEAF ELECTROSCOPE, IONIZATION CHAMBER AND GEIGER TUBE.
PROD-CENCO 8 COLOR SERIES-NR
DIST-ICF TC SILENT 1961

NUCLEAR RADIATION DETECTORS, PART II 4 MIN

SHOWS TYPES OF RADIATION TRACKS OBSERVED IN THE WILSON CLOUD CHAMBER, DIFFUSION CLOUD CHAMBER AND BUBBLE CHAMBER.
PROD-CENCO 8 COLOR SERIES-NR
DIST-ICF TC SILENT 1961

NUCLEAR RADIATION DETECTORS, PART III 4 MIN

PRINCIPLES OF OPEN AIR ALPHA COUNTER, SCINTILLATION DETECTORS AND SOLID STATE DETECTOR EXPLAINED.
PROD-CENCO 8 COLOR SERIES-NR
DIST-ICF TC SILENT 1961

PARAMAGNETISM OF LIQUID OXYGEN 3 MIN

LIQUID OXYGEN ADHERES TO POLE PIECES OF MAGNET - COMPARISON WITH LIQUID NITROGEN WHICH IS NOT PARAMAGNETIC .
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

PHOTOELECTRIC EFFECT 4 MIN

FOUR EXPERIMENTS, USING CHARGED ELECTROSCOPES AND A SOURCE OF ULTRA-VIOLET, ILLUSTRATE THE PHOTOELECTRIC EFFECT AND SHOW SPECIFICALLY THAT ELECTRIC CHARGES EXPELLED BY LIGHT ARE NEGATIVE.
PROD-UNESCO 8 BW SERIES-PPP
DIST-UNESCO TC TN 1964

PHOTOELECTRIC EFFECT 9 MIN

QUANTITATIVELY ESTABLISHES THE RELATION BETWEEN MAXIMUM KINETIC ENERGY OF PHOTOELECTRONS AND THE FREQUENCY OF THE INCIDENT LIGHT. CONCLUDES THAT THE LIGHT ENERGY COMES IN PHOTONS. EXCERPT FROM LONGER FILM OF SAME TITLE.
PROD-EDC 16 COLOR SERIES-PSSC
DIST-EDC RE SOUND 1962

PHOTO-ELECTRICITY 3 MIN

DEMONSTRATES THAT A NEGATIVELY CHARGED, POLISHED, METALLIC SURFACE LOSES ITS CHARGE WHEN ULTRA-VIOLET LIGHT FALLS ON IT, BUT RETAINS A POSITIVE CHARGE UNDER THE SAME CIRCUMSTANCES, REPEATING THE EXPERIMENTS THROUGH WHICH THE PHOTOELECTRIC EFFECT WAS DISCOVERED.
PROD-ECTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

PHOTO EMISSION OF ELECTRONS 4 MIN

CURRENT DETECTED WHEN LIGHT FALLS ON A NEGATIVELY CHARGED PHOTO-SENSITIVE SURFACE. NO CURRENT APPEARS WHEN THE POTENTIAL ON THE PHOTOCATHODE IS REVERSED.
COLLABORATOR--A. P. FRENCH
PROD-EDC 16 BW SERIES-EE
DIST-SET B RE SOUND 1965

PRECESSION CAMERA GEOMETRY 4 MIN

ANIMATED. SHOWS SPHERE OF REFLECTION CUT BY RECIPROCAL-LATTICE PLANE. SPOTS ON FILM RESULT WHEN RECIPROCAL-LATTICE POINTS PASS THROUGH SPHERE SURFACE.
NOT AVAILABLE FOR SALE
PROD-BTL 16 COLOR
DIST-BTL RE SILENT

PRINCIPLES OF NUCLEAR FISSION 10MIN

SHOWS RELATIONS OF THE BASIC PARTICLES--ELECTRON, PROTON AND NEUTRON. DESCRIBES IN DETAIL HOW BOMBARDING NEUTRONS CAUSE FISSION IN URANIUM-235 ATOMS AND THE PRODUCTION OF CHAIN REACTIONS.
PROD-EFVA 16 COLOR SERIES-AS
DIST-MGHT RE SOUND 1959

PRINCIPLES OF THERMAL, FAST AND BREEDER REACTORS 9 MIN

ANIMATED. EXPLAINS NUCLEAR FISSION, THE CHAIN REACTION, AND THE CONTROL OF THIS REACTION IN THREE BASIC TYPES OF REACTORS.
PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1963

QUANTUM MECHANICAL HARMONIC OSCILLATOR 4 MIN

COMPUTER-ANIMATED. DISPLAYS THE SOLUTION OF THE TIME-INDEPENDENT SCHROEDINGER EQUATION OF HARMONIC OSCILLATOR FOR LINEARLY INCREASING VALUES OF ENERGY (INCLUDING NON-EIGENVALUES) AND FOR TWO CHOICES OF BOUNDARY CONDITIONS AT ORIGIN.
COLLABORATOR--ALFRED BORK
PROD-EDC 8,16 BW
DIST-EDC TC,RE TN 1965

RADIOACTIVE DECAY 4 MIN

TIME-LAPSE PHOTOGRAPHY OF GAMMA-RAY DISPLAY OF 400-CHANNEL ANALYZER. SIMULTANEOUS DECAY OF 12.8-HR. CU 64 FOR 1 HALF-LIFE, AND 2.6-HR. MN 56 FOR 5 HALF-LIVES.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

RADIOACTIVE MATERIALS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

RADIOACTIVITY 1 1 MIN

AN ANIMATED DIAGRAM OF THE WELCH DIFFUSION CLOUD CHAMBER IN OPERATION.
PROD-HEIL 16 BW SERIES-RFL
DIST-WELCH RE SILENT

RADIOACTIVITY 2 1 MIN

RADIUM SALT IN A CLOUD CHAMBER PRODUCES ALPHA PARTICLES, LIGHT TRACKS DUE TO BETAS, COLLISIONS, AND OTHER EVENTS CHALLENGING INTERPRETATION.
PROD-HEIL 16 BW SERIES-RFL
DIST-WELCH RE SILENT

RADIOACTIVITY 3 1 MIN

SHOWS RELATIVE PENETRATING POWER OF ALPHA AND BETA RADIATION.
PROD-HEIL 16 BW SERIES-RFL
DIST-WELCH RE SILENT

RADIOACTIVITY 4 1 MIN

SHOWS EFFECTS OF GAMMA RAYS INTERACTING WITH ATOMS OF THE CHAMBER GAS, COSMIC RADIATION, AND CHAMBER CONTAMINATION.
PROD-HEIL 16 BW SERIES-RFL
DIST-WELCH RE SILENT

RADIOACTIVITY 5 1 MIN

SHOWS SUCCESSIVE EMISSION OF ALPHA PARTICLES DURING DIFFERENT STAGES OF THE DECAY OF RADON. ILLUSTRATED INSTRUCTIONS ARE INCLUDED.
PROD-HEIL 16 BW SERIES-RFL
DIST-WELCH RE SILENT

RADIUM 10MIN

DESCRIBES THE DISCOVERY OF PITCH BLEND IN ORE AND THE CURIES' EXPERIMENT LEADING TO DISCOVERY OF RADIUM. ILLUSTRATES THE BEHAVIOR PATTERN OF THE THREE COMPONENT RAYS OF RADIUM ALPHA, BETA, AND GAMMA RAYS.
PROD-ALFI 16 BW
DIST-ALFI RE SOUND 1952

RUTHERFORD-ROYD'S IDENTIFICATION OF ALPHA PARTICLES IN HELIUM 3 MIN

AFTER SHOWING THE ORIGINAL APPARATUS, SHOWS HG LEVEL IN FINE CAPILLARY TUBE COMPRESSING RADON WHICH EMITS ALPHA PARTICLES, SOME OF WHICH PENETRATE TUBE. AFTER 48 HOURS, NUMBER OF PARTICLES IS GREATLY INCREASED AND PHOTOPLATE REVEALS HE SPECTRUM, PROVING THAT HE WAS FORMED BY ACCUMULATION OF ALPHA PARTICLES.
PROD-HB 8 COLOR
DIST-EBF TC TN 1963

RUTHERFORD SCATTERING 4 MIN

COMPUTER ANIMATED. A COMPUTER MATHEMATICALLY SIMULATES RUTHERFORD EXPERIMENT ON A CATHODE RAY TUBE. STUDENT COMPARES HIS RESULTS WITH THOSE OF COMPUTER.
PROD-NFBC 8,8S,16 COLOR SERIES-IP-AN
DIST-EBF TC,RE TN,SN 1967

SCATTERING IN ONE DIMENSION--PART I - BARRIERS 4 MIN

COMPUTER ANIMATED. SHOWS REFLECTION AND TRANSMISSION OF A GAUSSIAN WAVE PACKET OF VARYING ENERGIES SCATTERED FROM A FINITE BARRIER.
COLLABORATOR--JUDAH SCHWARTZ
PROD-SET P 8 COLOR SERIES-QP
DIST-EDC TC TN 1968

SCATTERING IN ONE DIMENSION--PART II - SQUARE WELLS 4 MIN

COMPUTER ANIMATED. SHOWS REFLECTION AND TRANSMISSION OF A GAUSSIAN WAVE PACKET OF VARYING ENERGIES SCATTERED FROM A FINITE SQUARE WELL.
COLLABORATOR--JUDAH SCHWARTZ
PROD-SET P 8 COLOR SERIES-QP
DIST-EDC TC TN 1968

SCATTERING IN ONE DIMENSION--PART III - POTENTIAL WELLS 4 MIN

COMPUTER ANIMATED. SHOWS REFLECTION AND TRANSMISSION OF A GAUSSIAN WAVE PACKET OF GIVEN ENERGY SCATTERING FROM VARIOUS SHAPED POTENTIAL WELLS.
COLLABORATOR--JUDAH SCHWARTZ
PROD-SET P 8 COLOR SERIES-QP
DIST-EDC TC TN 1968

SCATTERING IN ONE DIMENSION--PART IV - MOMENTUM AND X-SPACE 4 MIN

COMPUTER ANIMATED. SHOWS REFLECTION AND TRANSMISSION OF A GAUSSIAN WAVE PACKET FROM A SQUARE WELL. THEN SHOWS THE CORRESPONDING MOMENTUM DISTRIBUTION OF THIS SAME EVENT.
COLLABORATOR--JUDAH SCHWARTZ
PROD-SET P 8 COLOR SERIES-QP
DIST-EDC TC TN 1968

SCATTERING OF QUANTUM MECHANICAL WAVE PACKETS FROM POTENTIAL WELL AND BARRIER 6 MIN

COMPUTER ANIMATED. IN SLOW MOTION, WAVE PACKETS MOVE ACROSS THE SCREEN AND SCATTER FROM A POTENTIAL WELL AND A POTENTIAL BARRIER. SHOWS THE CONTINUITY OF THE WAVE FUNCTION AND ITS SLOPE AT THE BOUNDARIES OF THE WELL AND BARRIER, THE CONSTRUCTIVE AND DESTRUCTIVE INTERFERENCE OF THE REFLECTED AND TRANSMITTED WAVES, AND THE SIZE AND SHAPE OF THE REFLECTED AND TRANSMITTED PACKETS.
COLLABORATORS--A. GOLDBERG, H. SHEY, AND J. SCHWARTZ
PROD-LRL 16 COLOR
DIST-PALMER RE SILENT 1966

SCINTILLATION SPECTROMETRY 3 MIN

SHOWS ASSEMBLY OF DETECTOR - DISPLAYS SINGLE GAMMA-RAY WITH VARIOUS STATISTICS - IDENTIFIES PHOTOPEAK, COMPTON EDGE, BACKSCATTER.
PROD-MILLER 8,8S,16 COLOR SERIES-DP
DIST-EFL TC,RE TN 1963

SPECTRUM OF THE HYDROGEN ATOM, THE 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

THOMSON'S POSITIVE RAY PARABOLAS 3 MIN

AFTER SHOWING THE ORIGINAL APPARATUS, A BEAM OF POSITIVE IONS (NE 20) PASSES THROUGH THE CATHODE AND STRIKES THE SCREEN. THE BEAM IS DEFLECTED BY ELECTRIC PLATES PRODUCING VERTICAL LINE ON SCREEN. MAGNETIC FIELD PRODUCES HORIZONTAL LINE. WHEN BOTH FIELDS ARE APPLIED AND THE MAGNETIC FIELD IS CHANGED, A PARABOLA IS PRODUCED.
PROD-HB 8 COLOR
DIST-EBF TC TN 1963

ULTIMATE SPEED, THE--AN EXPLORATION WITH HIGH ENERGY ELECTRONS 37MIN

MEASURES THE RELATIONSHIP BETWEEN THE KINETIC ENERGY OF ELECTRONS AND INVESTIGATES THEIR SPEED FOR THE RANGE OF ACCELERATING VOLTAGES 0.5 MEV TO 15 MEV. RESULTS INDICATE A LIMITING SPEED EQUAL TO THAT OF LIGHT.
COLLABORATOR--WILLIAM BERTOZZI
PROD-EDC 8 BW SERIES-CPF
DIST-EDC FC TN

U-238 RADIOACTIVE SERIES 9 MIN

TRACES THE VARIOUS STAGES IN THE DECAY OF U-238 TO STABLE LEAD. DISCUSSES ALPHA AND BETA EMISSIONS, THE STATISTICAL NATURE OF THE PROCESS, AND DESCRIBES BRIEFLY OTHER RADIOACTIVE SERIES.
PROD-MGHT 16 BW SERIES-ENP
DIST-MGHT RE SOUND 1954

WAVE NUMBER SPACE I--CONSTRUCTION OF THE WAVE NUMBER VECTOR 5 MIN

WAVE CONCEPTS ARE PRESENTED USING A RECTANGULAR LATTICE OF SOLID CIRCLES OF TWO BRIGHT COLORS AND VARYING SIZES TO REPRESENT WAVES. SINCE TRAVELING WAVES ARE USED, PERIODIC BOUNDARY CONDITIONS ARE DEVELOPED. A RECIPE FOR THE CONSTRUCTION OF THE WAVE NUMBER VECTOR IS GIVEN AND THE CONSTRUCTION IS ILLUSTRATED BY SEVERAL EXAMPLES.
NOT AVAILABLE FOR SALE
PROD-SET D 8,16 COLOR
DIST-SET D TC,RE SILENT 1966

WAVE NUMBER SPACE II--THE CONSTRUCTION OF BRILLOUIN ZONES 5 MIN

TREATMENT OF THE WAVE NUMBER VECTOR USED IN PART I IS EXTENDED TO SHORTER WAVE LENGTHS IN THIS FILM TO DEMONSTRATE THE PERIODICITY OF WAVE NUMBER SPACE AND THE CONSTRUCTION OF BRILLOUIN ZONES IN TWO DIMENSIONS. ILLUSTRATES SOME THREE-DIMENSIONAL BRILLOUIN ZONES.
NOT AVAILABLE FOR SALE
PROD-SET D 8,16 COLOR
DIST-SET D TC,RE SILENT 1966

WEIGHING THE ELECTRON 4 MIN

A CATHRODE RAY TUBE AND EXTERNAL MAGNETIC FIELD IS USED TO DETERMINE E/M FOR THE ELECTRON.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

Fluid Mechanics

ABLATION OF ICE MODELS IN A WATER TUNNEL 4 MIN

WATER FLOW PAST ICE MODELS SIMULATES SOME ASPECTS OF ABLATION OF HIGH-SPEED RE-ENTRY BODIES. RELATIVE RATES OF ABLATION AT DIFFERENT POSITIONS ON SEVERAL NOSE SHAPES ARE SHOWN.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1966

BATHUB VORTEX 5 MIN

ILLUSTRATES CORIOLIS FORCE, KELVIN'S CIRCULATION THEOREM AND HELMHOLTZ'S VORTEX LAWS WITH THE CONTROVERSIAL EXPERIMENT OF DIRECTION SWIRL WHEN WATER DRAINS FROM LARGE VESSEL THROUGH SMALL HOLE. EXCERPT FROM ''VORTICITY.''

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1962

BOUNDARY LAYER FORMATION 5 MIN

SHOWS HOW THE BOUNDARY LAYER THICKNESS NEXT TO A FLAT PLATE INCREASES WITH TIME WHEN THE FLOW IS STARTED IMPULSIVELY. EXCERPT FROM ''THE FLUID DYNAMICS OF DRAG.''
COLLABORATOR--ASCHER SHAPIRO

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1962

BOW WAVES IN HYPERSONIC FLOW 4 MIN

COLOR SCHLIEREN SHOWS WAVE PATTERN IN FLOWS AT MACH NUMBERS OF 7 AND 10 PAST DELTA GLIDER, DELTA WING AND PROJECT MERCURY RE-ENTRY CAPSULE MODELS. ANGLE OF ATTACK IS VARIED.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC	8	COLOR	SERIES-NCFMF
DIST-EBF	TC	TN	1966

BREAKDOWN OF LEADING-EDGE VORTICES ON DELTA WING IN SUBSONIC FLOW 4 MIN

MULTI-COLORED DYES SHOW FORMATION AND SUBSEQUENT UNSTABLE BREAKDOWN INTO TURBULENCE OF VORTEX COLUMNS.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC	8	COLOR	SERIES-NCFMF
DIST-EBF	TC	TN	1966

BREAKUP OF LIQUID INTO DROPS 4 MIN

DEMONSTRATES THAT THE PRESSURE DIFFERENCES CAUSED BY CURVED LIQUID SURFACES CAN LEAD TO BREAKUP INTO DROPS. EXPERIMENTS INCLUDE THE BREAKUP OF A WATER JET AND A RADIALLY EXPANDING SHEET OF WATER, THE RUPTURE OF A SOAP BUBBLE, AND THE IMPACT OF A MILK DROP ON A FLUID SURFACE, ALL SEEN IN SLOW MOTION. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC	8	COLOR	SERIES-NCFMF
DIST-EBF	TC	TN	1965

COANDA EFFECT 4 MIN

A FREE WATER JET BENDS AROUND FINGER OR CYLINDRICAL OBSTACLE. THE FORCE ON THE CYLINDER IS TOWARD THE JET. A MANOMETER SHOWS THE PRESSURE IS SUB-ATMOSPHERIC AT SURFACE OF CYLINDER UNDER THE JET. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1967

COMPUTER STUDIES OF FLUID DYNAMICS 8 MIN

COMPUTER PROGRAM SIMULATES VARIOUS FLUID DYNAMIC PROBLEMS.

PROD-LASL	16	BW
DIST-LASL	RE	SILENT

CURRENT INDUCED INSTABILITIES OF A MERCURY JET 4 MIN

CURRENT FLOWS IN A VERTICAL JET OF MERCURY. AXIAL MAGNETIC FIELDS FROM ZERO TO 8,000 GAUSS PRODUCE ''SAUSAGE'' AND ''CORKSCREW'' INSTABILITIES.
COLLABORATOR--A. CATTNER

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1964

DEFORMATION IN FLUIDS 4 MIN

ILLUSTRATED BY RECTILINEAR SHEAR FLOW. SURFACE POWDER ON GLYCERINE SHOWS DEFORMATION OF CIRCLE TO STRAIN ELLIPSE IN STATIONARY AND ROTATING COORDINATE SYSTEMS. PROPERTIES OF PRINCIPAL AXES OF STRAIN ILLUSTRATED. EXCERPT FROM ''DEFORMATION IN CONTINUOUS MEDIA.''

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1966

DETONATIONS 10MIN

SHOWS NORMAL COMBUSTION AND DETONATION TOGETHER WITH SHOCK WAVES.

PROD-AMOCO1	16	COLOR
DIST-AMOCO1	RE	SOUND

EFFECT OF AXIAL JET ON AFTERBODY SEPARATION 4 MIN

A WATER JET DISCHARGES AXIALLY FROM REAR OF ELLIPSOID, CIRCULAR CYLINDER, AND AIRCRAFT MODEL IN WATER FLOW. ENTRAINMENT OF SURROUNDING FLUID IN THE JET REDUCES AFT-END BOUNDARY LAYER SEPARATION.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC	8	COLOR	SERIES-NCFMF
DIST-EBF	TC	TN	1966

EFFECT OF JET BLOWING OVER AIRFOIL FLAP 4 MIN

DYE INJECTION IN A WATER TUNNEL AND SMOKE TESTS ON AN AIRPLANE SHOW HOW A TRAINING-EDGE FLAP ON AN AIRFOIL DEFLECTED AT A LARGE ANGLE CAN BE MADE MORE EFFECTIVE BY ENERGIZING THE BOUNDARY LAYER ON THE UPPER SURFACE WITH A JET.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATALIALES, FRANCE

PROD-EDC	8	COLOR	SERIES-NCFMF
DIST-EBF	TC	TN	1967

ELASTOID-INERTIA OSCILLATIONS IN A ROTATING FLUID 4 MIN

ILLUSTRATES SOME OF THE POSSIBLE STANDING OSCILLATIONS IN A PERTURBED ROTATING FLUID.

PROD-EDC	8	BW	SERIES-NCFMF
DIST-EBF	TC	TN	1964

EXAMPLES OF SURFACE TENSION 4 MIN

A NUMBER OF EXPERIMENTS ILLUSTRATE THE EXISTENCE OF SURFACE TENSILE FORCES. INCLUDED ARE--WATER DROPS ON FAUCET, SOAP FILM EXPANDED BY PULLING ITS EDGE, WATER SHEET RESULTING FROM JET IMPINGEMENT ON CONCAVE SOLID, CAPILLARY RISE, RUPTURE OF SOAP BUBBLE, IMPACT OF MILK DROP ON FLUID SURFACE, WATER DROPS ON WATERPROOF CLOTH. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1965

EXAMPLES OF TURBULENT FLOW BETWEEN ROTATING CYLINDERS 4 MIN

ILLUSTRATES SEVERAL FULLY TURBULENT FLOWS WHICH CAN OCCUR FOR DIFFERENT COMBINATIONS OF CYLINDER SPEEDS.
COLLABORATOR--D. COLES

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

FLOTATION IN ACTION 10MIN

SHOWS THE BEHAVIOR OF MINERAL PARTICLES IN THE VICINITY OF AN AIR BUBBLE WITH A GLASS FLOTATION CELL ON THE STAGE OF A MICROSCOPE (MAG. 16X). A FALLING STREAM OF PARTICLES MEETS A RISING COLUMN OF AIR BUBBLES IN THE FIELD OF VIEW.

PROD-SET O 16 BW
DIST-MIT RE SILENT 1947

FLOW FROM A RESERVOIR TO A DUCT 3 MIN

WATER FLOWS FROM A RESERVOIR INTO A CANAL. THE FLOW CAN BE OBSERVED BY HYDROGEN BUBBLES, PRODUCED BY ELECTROLYSIS. TWO CASES--1. THE CANAL IS JOINED TO THE RESERVOIR BY A RIGHT ANGLE. 2. THE CANAL IS JOINED TO THE RESERVOIR BY A BEND.
COLLABORATOR--P. W. RUNSTADLER

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

FLOW NEAR TIP OF LIFTING WING 4 MIN

MULTI-COLORED DYES AND ENTRAINED AIR BUBBLES SHOW THE FLOWS ON THE UPPER AND LOWER SURFACES OF A WING. RELATIONSHIP BETWEEN THESE FLOWS AND THE TRAILING WING-TIP VORTEX IS DEMONSTRATED.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

FLOW OVER AN UPSTREAM FACING STEP 4 MIN

THE EXTERNAL FLOW IS SEEN BY SCHLIEREN. VARYING THE INTERNAL RESISTANCE OF THE INLET DEMONSTRATES A DETACHED BOW SHOCK WAVE AND SWALLOWING AND DISGORGEMENT OF THE SHOCK.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1965

FLOW PATTERNS IN VENTURIS, NOZZLES AND ORIFICES 4 MIN

FLOW PATTERNS THROUGH THREE COMMON FLOW-METERING DEVICES ARE COMPARED. BOUNDARY-LAYER SEPARATION, JET CONTRACTION, AND MIXING AND ENTRAINMENT AT JET BOUNDARIES ARE ILLUSTRATED.
COLLABORATOR--P. W. RUNSTADLER

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

FLOW REGIMES IN SUBSONIC DIFFUSERS 4 MIN

A DIFFUSER WITH VARIOUS EXPANSION ANGLES EXHIBITS TRANSITORY STALL, FULLY-DEVELOPED STALL, AND JET FLOW. SUPPRESSION OF STALL BY VANES IS DEMONSTRATED. EXCERPT FROM ''FLOW VISUALIZATION.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

FLOW SEPARATION AND VORTEX SHEDDING 5 MIN

THE DEVELOPMENT OF SEPARATED FLOW PAST BODIES DUE TO BACKFLOW IN BOUNDARY LAYERS FACING ADVERSE PRESSURE GRADIENTS.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

FLOW THROUGH FANS AND PROPELLERS 4 MIN

AIR BUBBLES IN A WATER TUNNEL SHOW THE FLOW IN THE NEIGHBORHOOD OF A PROPELLER OR AN UNSHROUDED FAN. ALSO, DYE IS EMITTED AT THE PROPELLER BLADE TIPS.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

FLOW THROUGH PORTED CHAMBERS 4 MIN

SHOWS DEVELOPMENT AND ESTABLISHMENT OF STEADY-STATE FLOW THROUGH A CIRCULAR CHAMBER HAVING FOUR PIPE-LIKE PARTS ARRANGED AT 90 DEGREE INTERVALS. ROLE OF VISCOSITY AND COMPLEX CHARACTER OF THE FLOW ARE MADE EVIDENT.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

FLOW THROUGH RIGHT-ANGLE BENDS 4 MIN

PARTICLES ON WATER SURFACE SHOW DEVELOPMENT OF FLOW FROM REST TO STEADY STATE IN GRADUAL AND SHARP CHANNEL BENDS.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

FLOW THROUGH TEE-ELBOW 4 MIN

SHOWS DEVELOPMENT AND ESTABLISHMENT OF FLUID MOTION IN A TWO-DIMENSIONAL MODEL OF A TEE-FITTING, WITH DIFFERENT COMBINATIONS OF FLOW IN THE TWO OUTLET BRANCHES.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

FORMATION OF BUBBLES 4 MIN

ILLUSTRATES HOW BUBBLES ARE USUALLY FORMED AS PINCHED-OFF ENLARGEMENTS OF BUBBLES WHICH GROW FROM VAPOR POCKETS REMAINING IN CRACKS ON THE SURFACE OF SOLIDS. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1964

FORMATION OF SHOCK WAVES 4 MIN

AIR JET MOVES OVER WATER. WHEN SOURCE VELOCITY EXCEEDS WAVE VELOCITY (BY ABOUT 5 PERCENT) A SHOCK WAVE BUILDS UP AND MOVES ALONG WITH THE SOURCE. WHEN RATIO OF SOURCE VELOCITY TO WAVE VELOCITY IS 1.6, CONE OF SHOCK WAVE IS SHARP.
COLLABORATOR--JAMES STRICKLAND

PROD-EDC 8,16 BW SERIES-RTWP
DIST-SET F TC,RE TN 1962

GENERATION OF CIRCULATION AND LIFT FOR AN AIRFOIL 5 MIN

ILLUSTRATES HOW LIFT ON AN AIRFOIL IS ASSOCIATED WITH CIRCULATION AROUND IT PRODUCED BY VORTEX ''BOUND'' IN AIRFOIL. SHOWS HOW ESTABLISHMENT OF BOUND VORTEX IS RELATED TO PRODUCTION OF A STARTING VORTEX OWING TO VISCOUS ACTION AT TRAILING EDGE.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

HELE-SHAW ANALOG TO POTENTIAL FLOWS, PART I-- SOURCES AND SINKS IN UNIFORM FLOW 4 MIN

SOURCE AND SINK FLOWS, OF VARIOUS STRENGTHS AND DISTRIBUTIONS, ARE SUPERIMPOSED ON A UNIFORM FLOW FIELD. AMONG THE FLOW SITUATIONS ILLUSTRATED ARE--RANKINE HALF-BODY, RANKLINE OVAL, APPROXIMATE DOUBLET, AND A STREAMLINED SHAPE.

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

HELE-SHAW ANALOG TO POTENTIAL FLOWS, PART II-- SOURCES AND SINKS 4 MIN

DYE INJECTION SHOWS THE FLOW PATTERNS OF A SINGLE SOURCE, A SOURCE AND WEAKER SINK, TWO EQUAL SOURCES, A SOURCE NEAR A WALL.

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

HORSESHOE VORTEX, THE 4 MIN

A CYLINDER IS MOUNTED PERPENDICULAR TO THE FLOOR OF AN OPEN CHANNEL. HYDROGEN BUBBLES MARK THE FORMATION OF A HORSESHOE VORTEX AROUND THE CYLINDERS IN THE FLOOR BOUNDARY LAYER. EXCERPT FROM ''SECONDARY FLOW.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

INCOMPRESSIBLE FLOW THROUGH AREA CONTRACTIONS AND EXPANSIONS 4 MIN

SHOWS THE EFFECT OF THE RATE OF INCREASE AND DECREASE OF FLOW AREA ON THE INCOMPRESSIBLE FLOW OF FLUID IN A DUCT.
COLLABORATOR--P. W. RUNSTADLER

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

INFLUENCE OF A SINGLE-MOLECULE FILM ON MOVEMENT OF THE SUPPORTING LIQUID (FRENCH) 9 MIN

MOVEMENTS IN A LIQUID CAN BE MODIFIED BY THE PRESENCE OF A SINGLE-MOLECULE FILM ABSORBED ON ITS SURFACE.
NOT AVAILABLE FOR SALE

PROD-SET N 16 BW
DIST-FREM RE SOUND 1963

INSTABILITIES IN CIRCULAR COUETTE FLOW 4 MIN

ILLUSTRATES TWO SUCCESSIVE INSTABILITIES WHICH CAN OCCUR IN THE ANNULAR GAP BETWEEN CONCENTRIC CYLINDERS WHEN INNER CYLINDER IS ROTATED.
COLLABORATOR--D. COLES

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

INTERACTION BETWEEN OBLIQUE SHOCKS AND EXPANSION WAVES 4 MIN

SCHLIEREN VISUALIZATION OF THE LOCALLY SUPERSONIC FLOW OVER AN AIRFOIL ILLUSTRATES THE INTERACTIONS BETWEEN WAVES MOVING IN THE SAME DIRECTION IN A SUPERSONIC FLOW.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

INTERACTION OF OBLIQUE SHOCK WITH FLAT PLATE BOUNDARY LAYER 4 MIN

COLOR SCHLIEREN VISUALIZATION OF SHOCK-BOUNDARY LAYER INTERACTION AT MACH NUMBERS OF 2 AND 3, WITH BOTH LAMINAR AND TURBULENT BOUNDARY LAYERS.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

LEADING EDGE SEPARATION BUBBLE IN TWO-DIMENSIONAL FLOW 4 MIN

BOUNDARY-LAYER SEPARATION AND RE-ATTACHMENT RESULT IN A TRAPPED ZONE OF RECIRCULATION FLOW JUST AFT OF THE LEADING EDGES OF A FLAT PLATE WITH SEMI-CIRCULAR NOSE, AND OF AN AIRFOIL. DROOPING THE AIRFOIL LEADING EDGE ELIMINATES THE BUBBLE. EXCERPT FROM ''BOUNDARY LAYER CONTROL.''
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

LEADING-EDGE VORTICES ON DELTA WING IN SUBSONIC FLOW 4 MIN

MULTI-COLORED DYES SHOW FORMATION AND ROLL-UP OF VORTICES ALONG LEADING EDGE OF LIFTING DELTA WING.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

MAGNUS EFFECT, THE 5 MIN

ILLUSTRATES HOW LATERAL FORCE PRODUCED ON ROTATING CYLINDER MOVING THROUGH FLUID IS RELATED TO CIRCULATION AROUND CYLINDER PRODUCED BY SHEDDING OF A STARTING VORTEX DUE TO ASYMETRIC VISCOUS ACTION.
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

MOTIONS CAUSED BY COMPOSITION GRADIENTS ALONG LIQUID SURFACES 4 MIN

LOCAL GRADIENTS IN SURFACE TENSION CAUSED BY SOAP, CAMPHOR, ETHER VAPOR, AND ALCOHOL RESULT IN MOTION OF A LOOP OF STRING, A MODEL BOAT, A WATER FILM, AND ''WINE TEARS'' ON A GLASS. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1965

MOTIONS CAUSED BY ELECTRICAL AND CHEMICAL EFFECTS ON LIQUID SURFACES 4 MIN

ILLUSTRATES BY THE TWO EXPERIMENTS KNOWN AS THE ''BEATING HEART'' AND THE ''MERCURY AMOEBA'' HOW ELECTRICAL CHARGES AND CHEMICAL EFFECTS AT INTERFACES CAN CAUSE MOTIONS OF LIQUIDS. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1964

MOTIONS CAUSED BY TEMPERATURE GRADIENTS ALONG LIQUID SURFACES 4 MIN

THE EXPERIENCES SHOW THE EFFECT OF HOT AND COLD SPOTS ON A THIN LAYER OF SILICONE, THE MOTION OF AN AIR BUBBLE IN A TEMPERATURE GRADIENT, AND ''DANCING'' VAPOR BUBBLES ON A HEATED WIRE IN A LIQUID MIXTURE. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

OCCURRENCE OF TURBULENCE, THE 4 MIN

SHOWS SOME TURBULENT FLOWS, INCLUDING EXAMPLES IN WHICH LAMINAR FLOWS BECOME TURBULENT WITH AN INCREASE OF REYNOLDS NUMBER.
COLLABORATOR--S. CORRSIN

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

PASSAGE OF A SHOCK WAVE THROUGH A CIRCULAR ORIFICE

ULTRA HIGH SPEED SHADOWGRAPH PHOTOGRAPHY SHOWS THE WAVE PATTERNS AND FLOWS AS A NORMAL SHOCK WAVE PASSES THROUGH A CIRCULAR ORIFICE PLATE MOUNTED IN A SHOCK TUBE.
COLLABORATOR--ING. H. SHARDIN
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC 1967

PATHLINES, STREAKLINES, AND STREAMLINES IN UNSTEADY FLOW 4 MIN

HYDROGEN BUBBLES MARK WATER FLOW PAST AN OSCILLATING FLAT PLATE. THE DISTINCTION BETWEEN PATH, STREAK AND STREAMLINES IS MADE CLEAR BY FREEZE FRAMES AND OPTICAL SUPERPOSITIONS. EXCERPT FROM ''FLOW VISUALIZATION.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

PATHLINES, STREAKLINES, STREAMLINES, AND TIMELINES IN STEADY FLOW 4 MIN

THE VARIOUS LINES AND THE RELATIONSHIPS BETWEEN THEM ARE ILLUSTRATED BY GENERATION OF HYDROGEN BUBBLES IN WATER FLOW IN A TWO-DIMENSIONAL CONTRACTION. EXCERPT FROM ''FLOW VISUALIZATION.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

PROPAGATING STALL IN CASCADES 4 MIN

SHOWS VISUAL EVIDENCE OF THE PHENOMENON OF PROPAGATING STALL OCCURRING IN AXIAL FLOW COMPRESSORS (ROTATING STALL) AND WHICH CAN BE SEEN IN AIR DISCHARGE LOUVERS AND VENETIAN BLINDS.
COLLABORATOR--G. SOVRAN
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

RADIAL FLOW BETWEEN PARALLEL DISCS 4 MIN

ILLUSTRATES BY EXPERIMENT AND EXPLAINS WITH BERNOULLI INTEGRAL WHY RADIAL FLOW BETWEEN TWO PARALLEL DISCS TENDS TO FORCE DISCS TOGETHER. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

SECONDARY FLOW IN A BEND 4 MIN

HYDROGEN BUBBLES MARK FLUID LINES (AND VORTEX LINES) IN WATER FLOW IN A DUCT, SHOWING THAT TRANSVERSE VORTICITY IN THE STRAIGHT SECTION UPSTREAM BECOMES STREAMWISE VORTICITY AS THE FLOW ROUNDS A BEND IN THE CHANNEL, THUS ACCOUNTING FOR THE SECONDARY FLOW. EXCERPT FROM ''SECONDARY FLOW.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

SEPARATED FLOWS--PART I 5 MIN

SOME PHENOMENA OF BOUNDARY LAYER SEPARATION--A) LAMINAR AND TURBULENT BOUNDARY ON UNSTREAMLINED BODY - B) EFFECT OF STREAMLINING ON SIZE OF THE SEPARATED WAKE - C) OCCURRENCE OF SEPARATION AT HIGH AND ITS ABSENCE AT LOW REYNOLDS NUMBERS. EXCERPT FROM ''THE FLUID DYNAMICS OF DRAG.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

SEPARATED FLOWS--PART II 5 MIN

SHOWS SEPARATED FLOWS PASS ROUGH BODIES AT LOW AND HIGH REYNOLDS NUMBERS, AND THAT ARTIFICIAL INTRODUCTION OF TURBULENCE CAN SUPPRESS SEPARATION OF LAMINAR BOUNDARY LAYERS. EXCERPT FROM ''THE FLUID DYNAMICS OF DRAG.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

SHEAR DEFORMATION OF VISCOUS FLUIDS 5 MIN

DYED FLUID LINES MARK SURFACE OF GLYCERINE IN AN ANNULAR CONTAINER. ROTATION OF INNER CYLINDER SHOWS--(1) NO SLIP AT WALL - (2) DIFFUSION OF VORTICITY - (3) DEFORMATION OF FLUID SQUARE. EXCERPT FROM ''THE FLUID DYNAMICS OF DRAG.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

SHOCK AND BOUNDARY LAYER INTERACTION ON TRANSONIC AIRFOIL 4 MIN

FILMED WIND TUNNEL EXPERIMENT SHOWS THAT FLOW PATTERN NEAR AN AIRFOIL AT TRANSONIC SPEEDS IS GREATLY INFLUENCED BY THE INTERACTION BETWEEN THE SHOCK WAVE TERMINATING THE SUPERSONIC ZONE AND THE BOUNDARY LAYER ON AIRFOIL SURFACE.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

SINK VORTEX, THE 4 MIN

SEVERAL ASPECTS OF A QUASI TWO-DIMENSIONAL SINK-VORTEX WATER FLOW IN VESSEL HAVING FREE SURFACE AND BOTTOM--1. STARTING VORTEX - 2. STREAMLINES AND VELOCITY DISTRIBUTION AT SURFACE - 3. VORTICITY ABOUT MIDWAY BETWEEN FREE SURFACE AND BOTTOM - 4. SECONDARY FLOW NEAR BOTTOM.
COLLABORATOR--L. PRANDTL
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

SLOT BLOWING TO SUPPRESS SHOCK-INDUCED SEPARATION 4 MIN

JET BLOWING FROM A SLOT AFT OF AIRFOIL LEADING EDGE ENERGIZES THE BOUNDARY LAYER AND SUPPRESSES SHOCK-INDUCED FLOW SEPARATION AT TRANSONIC SPEEDS.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1966

SMALL AMPLITUDE WAVES 4 MIN

REFRACTED LIGHT FROM THE FREE SURFACE OF A SHALLOW WATER TABLE SHOWS WAVES FROM A POINT AND PLANAR SOURCE AND THE REFLECTIONS OF THESE FROM PLANE, CIRCULAR, ELLIPTICAL AND PARABOLIC BOUNDARIES. EXCERPT FROM ''REFLECTION AND REFRACTION.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

SOME REGIMES OF BOUNDARY LAYER TRANSITION 4 MIN

DYE IS INJECTED INTO BOUNDARY LAYER FROM TRANSVERSE SLOT IN FLOOR OF OPEN WATER CHANNEL. INCREASING REYNOLDS NUMBER, BY MOVING DOWNSTREAM, SHOWS SUCCESSIVELY LAMINAR FLOW, STREAKS, TURBULENT SPOTS, FULL TURBULENCE.
COLLABORATORS--H. EMMONS, S. KLINE AND K. MEYER
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

SOURCE MOVING AT SPEEDS BELOW AND ABOVE WAVE SPEEDS 4 MIN

REFRACTED LIGHT FROM THE FREE SURFACE OF A SHALLOW WATER TABLE SHOWS THE TYPES OF DISTURBANCE FIELDS PRODUCED BY A DISTURBANCE SOURCE THAT MOVES WITH RESPECT TO THE FLUID. ANALOGY TO A SOURCE IN SUBSONIC, TRANSONIC AND SUPERSONIC COMPRESSIBLE FLOW. EXCERPT FROM ''DOPPLER EFFECT.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

STAGNATION PRESSURE 4 MIN

ILLUSTRATES--1. IDEA OF STAGNATION POINT - 2. MEASUREMENT OF STAGNATION PRESSURE BY MEANS OF PILOT PROBE - 3. DETERMINATION OF VELOCITY FROM MEASUREMENTS OF STAGNATION AND STATIC PRESSURE. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

STREAMLINE CURVATURE AND NORMAL PRESSURE GRADIENT 4 MIN

ILLUSTRATES BY EXPERIMENTS THAT IN A STEADY INVISCID FLOW THE PRESSURE GRADIENT NORMAL TO THE STREAMLINE IS RELATED TO THE STREAMLINE CURVATURE. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

STREAMWISE PRESSURE GRADIENT IN INVISCID FLOW 4 MIN

ILLUSTRATES THE ONE-DIMENSIONAL APPROXIMATION TO THE DYNAMICS OF A STEADY FLOW IN CIRCUMSTANCES WHERE VISCOSITY IS RELATIVELY UNIMPORTANT. ATTENTION IS CENTERED--1. ON CONNECTION BETWEEN DUCT GEOMETRY AND AVERAGE VELOCITY - 2. ON THE DYNAMICAL RELATION BETWEEN PRESSURE GRADIENT AND ACCELERATION. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

STRUCTURE OF THE TURBULENT BOUNDARY LAYER 4 MIN

TIME-LINES OF HYDROGEN BUBBLES AT DIFFERENT DISTANCES FROM THE WALL SHOW THE FLOW IN DIFFERENT REGIONS--INVISCID, WAKE, FULLY-TURBULENT, BUFFER, WALL LAYER.
COLLABORATORS--P. RUNSTADLER, S. KLINE AND W. REYNOLDS

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

SUPERSONIC CONICAL-SPIKE INLET 4 MIN

THE EXTERNAL FLOW IS SEEN BY SCHLIEREN. MACH NUMBER AND INTERNAL RESISTANCE ARE VARIABLE - SHOWS DETACHED SHOCK, SWALLOWING AND DISGORGEMENT OF SHOCK, BUZZ.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

SUPERSONIC FLOW PAST DIAMOND AIRFOIL 4 MIN

SCHLIEREN SHOWS THE WAVE PATTERN FOR STEADY SUPERSONIC FLOW PAST A DIAMOND-SHAPED AIRFOIL AT ZERO INCIDENCE AND, ALSO, THE ESTABLISHMENT OF STEADY SUPERSONIC FLOW.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

SUPERSONIC ZONES ON AIRFOILS IN SUBSONIC FLOW 4 MIN

SCHLIEREN SHOWS LOCAL SHOCK WAVES AS MACH NUMBER IS INCREASED TO NEARLY UNITY, WITH AIRFOIL AT CONSTANT INCIDENCE. ALSO AT CONSTANT MACH NUMBERS OF 0.75 AND 0.80, INCIDENCE IS INCREASED TO STALL POINT.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

SURFACE TENSION AND CONTACT ANGLES 4 MIN

SHOWS HOW THE SHAPE OF A LIQUID SURFACE IS INFLUENCED BY THE ANGLES THE LIQUID ASSUMES AT ITS EDGES. THESE ANGLES (CONTACT ANGLES) PROVIDE ONE OF THE THREE BOUNDARY CONDITIONS NEEDED TO EXPRESS MATHEMATICALLY THE EFFECTS OF SURFACE TENSION IN FLUID MECHANICS.
EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

SURFACE TENSION AND CURVED SURFACES 4 MIN

EJECTION OF SMOKE FROM SOAP BUBBLE, WATER DROP ON FAUCET, COMPARISON OF CAPILLARY RISE OF WATER AND ALCOHOL, AND WATER-JET BREAK-UP DEMONSTRATE THE EXISTENCE OF A PRESSURE DIFFERENCE ACROSS CURVED LIQUID SURFACES. EXCERPT FROM ''SURFACE TENSION IN FLUID MECHANICS.''

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1965

SURFACE TENSION IN FLUID MECHANICS 29MIN

EXPERIMENTS ILLUSTRATE EFFECTS OF SURFACE TENSION, INCLUDING SOAP FILM INTERSECTIONS, CAPILLARY ACTION, WETTING AND NON-WETTING DROPLETS, A DROP SPLASHING IN SLOW MOTION, BUBBLE MOTION IN TEMPERATURE GRADIENTS AND OTHERS.
COLLABORATOR--FLOYD M. TREFETHEN

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF FC TN 1964

TECHNIQUES OF VISUALIZATION FOR LOW SPEED FLOWS--PART I 4 MIN

SEVERAL FLOWS ARE VISUALIZED BY SURFACE POWDERS, DYE INJECTION AND THE ELECTROLYTIC GENERATION OF HYDROGEN BUBBLES. EXCERPT FROM ''SECONDARY FLOW,'' ''FLOW VISUALIZATION,'' AND ''VORTICITY.''
COLLABORATOR--L. PRANDTL

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

TECHNIQUES OF VISUALIZATION FOR LOW SPEED FLOWS--PART II 4 MIN

SEVERAL FLOWS IN AIR AND WATER ARE VISUALIZED WITH TI-CL4, VAPORIZED KEROSENE, TUFTS, AIR BUBBLES IN WATER, ALUMINUM FLAKES AND REFRACTED LIGHT. EXCERPT FROM ''THE FLUID DYNAMICS OF DRAG,'' ''BOUNDARY LAYER CONTROL,'' ''FLOW INSTABILITIES,'' AND ''DOPPLER EFFECT.''
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1967

THIN BODIES OF REVOLUTION AT INCIDENCE 4 MIN

FLOW PAST A SLENDER CONE AND AN OGIVE-NOSE CYLINDER IS VIEWED IN VARIOUS PLANES. THE CROSS FLOW TRANSVERSE TO MODEL AXIS SHOWS SEPARATION ZONES SIMILAR TO TWO-DIMENSIONAL FLOW PAST A CIRCULAR CYLINDER.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1966

THREE DIMENSIONAL BOUNDARY-LAYER SEPARATION 4 MIN

MULTI-COLORED DYES SHOW THE NATURE OF THREE DIMENSION BOUNDARY LAYER SEPARATION AND SEPARATED REGIONS IN THE FLOW PAST AN ELLIPSOID OF REVOLUTION AT ZERO INCIDENCE AND AT 6 DEGREES INCIDENCE.
COLLABORATOR--OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, FRANCE

PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1967

TOLLMIEN-SCHLICHTING WAVES 4 MIN

SMOKE STREAKLINES INJECTED AT LEADING EDGE OF UNSWEPT AND SWEPT WINGS IN WIND TUNNEL EXHIBIT PERIODIC, WAVE-LIKE DISTURBANCES BEFORE COMPLETE TRANSITION TO TURBULENT CONDITION.
COLLABORATOR--A. M. LIPPISCH

PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

TORNADOES IN NATURE AND THE LABORATORY 4 MIN

ABOUT A DOZEN NATURAL TORNADOES ARE SHOWN. SOME ASPECTS OF TORNADOES ARE SIMULATED IN A LABORATORY EXPERIMENT, USING WATER AND DYE INJECTION. EXCERPT FROM ''VORTICITY'' AND ''SECONDARY FLOW.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

TRANSITION FROM LAMINAR TO TURBULENT FLOW 10MIN

DEALS WITH THE EFFECTS OCCURRING AT THE CRITICAL TRANSITION FROM STREAM-LINE FLOW TO TURBULENT FLOW IN A FLUID.
PROD-IWF 16 COLOR SERIES-EC
DIST-IWF RE SILENT

TRANSONIC FLOW PAST A SYMMETRIC AIRFOIL 4 MIN

COLOR SCHLIEREN VISUALIZES SHOCK WAVES AND QUALITATIVELY INDICATES PRESSURE DISTRIBUTION IN FLOW PAST AIRFOIL AS FREE STREAM AIR SPEED IS INCREASED FROM SUBSONIC TO SUPERSONIC. INCIDENCE IS PERIODICALLY VARIED PLUS/MINUS 2 DEGREES AT A HIGH SUBSONIC AND AT A LOW SUPERSONIC AIR SPEED.
COLLABORATOR--NATIONAL PHYSICAL LABORATORY, ENGLAND
PROD-EDC 8 COLOR SERIES-NCFMF
DIST-EBF TC TN 1965

VELOCITIES NEAR AN AIRFOIL 4 MIN

SMOKE STREAKLINES IN AIR AND HYDROGEN BUBBLES IN WATER SHOW DIFFERENCES IN FLOW SPEED ABOVE AND BELOW AIRFOILS FOR DIFFERENT ANGLES OF ATTACK. EXCERPT FROM ''FLOW VISUALIZATION'' AND ''BOUNDARY LAYER CONTROL.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

VENTURI PASSAGE 4 MIN

FLOW PATTERNS AND PRESSURE DISTRIBUTIONS OF VENTURIS WITH SMALL AND LARGE DIFFUSER ANGLES ARE SHOWN. LOW PRESSURES AT THROAT OF VENTURI CAN RESULT IN CAVITATION IN WATER, AND CAN BE PUT TO USE IN A JET PUMP. EXCERPT FROM ''PRESSURE FIELDS AND FLUID ACCELERATION.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1965

VIBRATING LIQUID SURFACES AS GENERATORS OF BUBBLES AND DROPS 10MIN

NO INFORMATION AVAILABLE.
NOT AVAILABLE FOR SALE
PROD-BTL 16 BW
DIST-BTL RE SILENT 1954

VISUALIZATION OF VORTICITY WITH VORTICITY METER--PART I 5 MIN

A FLOAT WITH CROSSED VANES IMMERSED IN WATER ROTATES WITH ANGULAR SPEED OF HALF THE FLUID VORTICITY. THE VORTICITY DISTRIBUTION IS SHOWN IN A BOUNDARY LAYER ALONG A STRAIGHT WALL, IN A FLOW WITH SOLID-BODY ROTATION, AND IN AN IRROTATIONAL SINK VORTEX. EXCERPT FROM ''VORTICITY.''
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

VISUALIZATION OF VORTICITY WITH VORTICITY METER--PART II 5 MIN

CONTINUATION OF PART I.
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1962

WIDE-ANGLE DIFFUSER WITH SUCTION 4 MIN

SHOWS HOW BOUNDARY LAYER SUCTION CAN ELIMINATE SEPARATION OWING TO AN ADVERSE PRESSURE GRADIENT. ILLUSTRATES ALSO HOW A WIDE-ANGLE DIFFUSER CAN BE MADE TO OPERATE EFFECTIVELY WITH THE HELP OF BOUNDARY LAYER SUCTION.
COLLABORATOR--L. PRANDTL
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

WING-TIP VORTEX 4 MIN

TRAILING VORTEX AT WING TIP IS VISUALIZED BY SMOKE INJECTION AND BY A TUFT GRID DOWNSTREAM OF AN AIRFOIL IN A WIND TUNNEL. VORTEX STRENGTH CHANGES AS LIFT IS VARIED BY CHANGING ANGLE OF ATTACK.
COLLABORATORS--A. M. LIPPISCH AND NASA.
PROD-EDC 8 BW SERIES-NCFMF
DIST-EBF TC TN 1964

Astronomy

ADVANCE OF PERIHELION 4 MIN

COMPUTER ANIMATED. ILLUSTRATES PRECESSION. THE INFLUENCE OF A THIRD BODY. SHOWS A PARTICULAR CASE OF THE LAW OF GRAVITY--WHEN THE FORCE IS NOT EXACTLY INVERSE SQUARE, IT GIVES RISE TO PRECESSION.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-H
DIST-EBF	TC,RE	TN,SN	1967

ASTRONOMER, THE 16MIN

DESCRIBES METHODS AND TOOLS USED BY PRESENT-DAY ASTRONOMERS. SHOWS CONSTRUCTION AND FUNCTIONS OF 200-INCH HALE TELESCOPE, THE SOLAR TOWER, SCHMIDT-TYPE TELESCOPE, REFRACTOR, REFLECTORS AND RADIO TELESCOPES. STRESSES MEASUREMENTS AND ANALYSIS OF PHOTOGRAPHS AND SPECTROGRAMS.

PROD-VEF	8	COLOR	
DIST-IFB	FC	TN	

AURORA BOREALIS (GERMAN) 5 MIN

TIME-LAPSE CINEMATOGRAPHIC RECORD OF THE AURORA BOREALIS RECORDED ON AN EXPEDITION TO TROMS, NORWAY, SHOWING ALL PHASES OF THE AURORA.

PROD-BAUER	16	BW	
DIST-NSFL	RE	SILENT	1932

CELESTIAL MECHANICS AND THE LUNAR PROBE 10MIN

ANIMATED. EXPLAINS ARRANGEMENT OF SOLAR SYSTEM AND DESCRIBES THE MECHANICS OF GUIDING LUNAR PROBES.

PROD-NASA	16	COLOR	
DIST-NASA	RE	SOUND	1959

COMET ORBITS 3 MIN

ANIMATED. DEMONSTRATES THE UNUSUAL NATURE OF COMET ORBITS. PHOTOGRAPHS OF COMETS SHOWN.

PROD-FAC	8	COLOR	SERIES-SS
DIST-FAC	TC	TN	1964

COMPUTER I

COMPUTER ANIMATED. FILM RELATED TO A STUDENT LAB WHERE STUDENT PLOTS THE ORBIT OF A PLANET. A COMPUTER'S SKILL IS MATCHED TO THAT OF THE STUDENT. X-Y PLOT DISPLAY IS USED.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-H
DIST-EBF	TC,RE	TN	1967

COMPUTER II--PROGRAM ORBIT 4 MIN

COMPUTER ANIMATED. WORK OF STUDENT PLOTTING A PLANET ORBIT IS COMPARED TO THE CATHODE RAY TUBE DISPLAY. CONTINUATION OF COMPUTER I.

PROD-NFBC	8,8S,16	COLOR	SERIES-IP-H
DIST-EBF	TC,RE	TN	1967

EARTH'S SHAPE 4 MIN

MODELS DEMONSTRATE THAT A LUNAR ECLIPSE IS CAUSED BY THE MOON MOVING INTO THE EARTH'S SHADOW. TELESCOPIC TIME-LAPSE PHOTOGRAPHY OF A LUNAR ECLIPSE SHOWS THE ADVANCING CIRCULAR SHADOW OF THE EARTH. FINALLY, MOTION PICTURES TAKEN FROM A HIGH ALTITUDE ROCKET SHOW THE CURVE OF THE EARTH'S SURFACE.

PROD-FAC	8	COLOR	SERIES-ES
DIST-FAC	TC	TN	1965

ECLIPSE AT GRAND'MERE 6 MIN

SHOWS THE ECLIPSE OF THE SUN ON 10 JULY 1963.

PROD-NFBC	16	BW	
DIST-NFBC	RE	SOUND	1963

ECLIPSE OF THE MOON 4 MIN

ANIMATED MODELS DEMONSTRATE HOW THE MOON'S MOTION MAY CARRY IT INTO THE EARTH'S SHADOW, PRODUCING A LUNAR ECLIPSE. ACTUAL LUNAR ECLIPSE SHOWN IN TELESCOPIC TIME-LAPSE MOTION PICTURES. ANIMATION IS USED TO EXPLAIN HOW THE TILT OF THE MOON'S ORBIT IS RESPONSIBLE FOR THE INTERVALS BETWEEN ECLIPSES, BOTH SOLAR AND LUNAR.

PROD-FAC	8	COLOR	SERIES-SS
DIST-FAC	TC	TN	1964

ECLIPSE OF THE SUN 4 MIN

ANIMATED. DEMONSTRATES HOW THE MOTION OF THE MOON AROUND THE EARTH CAN POSITION IT BETWEEN EARTH AND SUN. TELESCOPIC MOTION PICTURE OF A SOLAR ECLIPSE IS SHOWN AS WELL AS ADDITIONAL FEATURES OF THE SUN, VISIBLE DURING ECLIPSES.

PROD-FAC	8	COLOR	SERIES-SS
DIST-FAC	TC	TN	1964

EXPLORING THE NIGHT SKY 10MIN

STORY OF CONSTELLATIONS, NEBULAE, THE SETTING AND RISING OF STARS.

PROD-EBF	16	BW	
DIST-EBF	RE	SOUND	1956

EXPLORING THE UNIVERSE 10MIN

HOW THE STAR SYSTEMS ARE MOVING AND WHERE THEY ARE GOING IN RELATION TO OUR OWN SOLAR SYSTEM. EXPLAINS THE PRINCIPLES OF REFRACTING AND REFLECTING TELESCOPES.

PROD-EBF	16	BW	
DIST-EBF	RE	SOUND	1937

EYES IN SPACE 9 MIN

ANIMATED. STORY OF ORBITING ASTRONOMICAL OBSERVATORY WHOSE MISSION IS TO UNVEIL MYSTERIES OF THE UNIVERSE THROUGH ULTRAVIOLET MAPPING OF THE STARS.
NOT AVAILABLE FOR SALE

PROD-IBM	16	COLOR	
DIST-IBM	RE	SOUND	

INTRODUCING GLOBES 10MIN

SHOWS HOW THE GLOBE MODEL OF THE EARTH CAN BE USED TO INTRODUCE SUCH CONCEPTS AS THE SHAPE AND SIZE OF THE EARTH, DISTANCES AND EARTH ROTATION.

PROD-BFI	16	COLOR	
DIST-BFI	RE	SOUND	1964

JUPITER, SATURN AND MARS IN MOTION 8 MIN

TIME-LAPSE PHOTOGRAPHS TAKEN THROUGH THE 60-INCH MT. WILSON TELESCOPE ILLUSTRATE CHARACTERISTICS OF PLANETS.
COLLABORATOR--ROBERT B. LEIGHTON

PROD-EBF	16	COLOR	
DIST-EBF	RE	SILENT	

KEPLER'S LAW 4 MIN

COMPUTER ANIMATED. CATHODE RAY TUBE IS PROGRAMMED TO SHOW TWO ORBITING BODIES. WITH THIS VISUAL INFORMATION PROJECTED ON A SHEET, THE STUDENT CAN PLOT THE PATH OF SUCH BODIES AND VERIFY THE LAW OF AREAS AND KEPLER'S THIRD LAW.

PROD-NFBC 8,8S,16 COLOR SERIES-IP-H
DIST-EBF TC,RE TN,SN 1967

MARS AND JUPITER 4 MIN

TELESCOPIC TIME-LAPSE MOTION PICTURES OF MARS AND JUPITER SHOW THEIR GROSS SURFACE FEATURES. ROTATION IS OBSERVED, AS WELL AS A TRANSIT OF ONE OF JUPITER'S MOONS.

PROD-FAC 8 COLOR SERIES-SS
DIST-FAC TC TN 1964

ORBIT GRAPHING BY ITERATION 4 MIN

COMPUTER ANIMATED. SHOWS THE GRAPHICAL DEVELOPMENT OF AN ORBIT FOR A SIMPLE LAW OF FORCE--A CONSTANT BUT CENTRAL ATTRACTIVE FORCE--BY DEVELOPING THE MOTION OF A SATELLITE IN ITS ORBIT AROUND THE EARTH ON PAPER. TWO TRIANGLES (OR PARTS OF THEM) ARE DRAWN AT EACH STEP. THE TWO TRIANGLES ARE EQUIVALENT TO THE DEFINITIONS OF VELOCITY AND ACCELERATION.
COLLABORATOR--LEO LAVATELLI

PROD-ILL 8 BW
DIST-ILL TC TN

ORBIT OF JUPITER SATELLITE 4 MIN

SHOTS OF JUPITER ON 5 NON-CONSECUTIVE NIGHTS USING THE 24-INCH TELESCOPE AT FLAGSTAFF OBSERVATORY. STUDENT CAN MEASURE THE PERIOD OF THE ORBIT OF SATELLITE IO.

PROD-NFBC 8,8S,16 COLOR SERIES-IP-H
DIST-EBF TC,RE TN,SN 1967

PLANETS IN ORBIT--THE LAWS OF KEPLER 10MIN

TRACES MAN'S EARLIEST OBSERVATIONS AND BELIEFS ABOUT THE UNIVERSE - EXPLAINS KEPLER'S THREE LAWS USING ANIMATION.
COLLABORATOR--FRED L. WHIPPLE

PROD-EBF 16 BW
DIST-EBF RE SOUND 1961

RANGER VII PHOTOGRAPHS OF THE MOON 7 MIN

STEP-PRINTED TV PHOTOGRAPHS OF THE MOON TAKEN AS RANGER VII APPROACHED THE MOON ON 31 JULY 1964 ARE DESCRIBED. DETAILED DESCRIPTIONS OF SELECTED PHOTOGRAPHS ARE GIVEN AT THE END.

PROD-JPL 16 BW
DIST-NASA RE SOUND 1964

RETROGRADE MOTION OF A PLANET--CURRENT MODEL 4 MIN

A LARGE MECHANICAL MODEL GIVES CIRCULAR ORBITS TO EARTH AND MARS OR TO EARTH AND AN INFERIOR PLANET. MOTION IS VIEWED FROM ABOVE AND FROM A CAMERA, MOVING IN EARTH'S PLACE.

PROD-NFBC 8,8S,16 COLOR SERIES-IP-H
DIST-EBF TC,RE TN 1967

RETROGRADE MOTION OF A PLANET--PTOLEMAIC MODEL 4 MIN

A LARGE EPICYCLE MACHINE SHOWS EARTH AT CENTER, MARS ON EPICYCLE. ITS MOTION IS SHOWN AS VIEWED FROM ABOVE AND FROM THE EARTH.

PROD-NFBC 8,8S,16 COLOR SERIES-IP-H
DIST-EBF TC,RE TN 1967

SHADOWS AND ECLIPSES 10MIN

FORMATION OF SHADOWS AND ECLIPSES EXPLAINED BY ANIMATION. PLOTS SHOW SUN IN TOTAL ECLIPSE, SUN'S CORONA AND EARTH'S SHADOW MOVING ACROSS THE MOON. LAW OF REFLECTION DEMONSTRATED AND PROPERTIES OF IMAGES IN PLANE MIRRORS ILLUSTRATED AND EXPLAINED.

PROD-UWF 16 BW SERIES-LIGHT
DIST-UWF RE SOUND 1950

SIMULATION OF A TWO-GYRO GRAVITY-GRADIENT ATTITUDE CONTROL SYSTEM 4 MIN

COMPUTER ANIMATED. SATELLITE SHOWN IN ORBIT AROUND A ROTATING EARTH. ILLUSTRATES GYRO ACTION OF THE CONTROL SYSTEM.
COLLABORATOR--E. E. ZAJAC

PROD-BTL 16 BW
DIST-BTL RE SILENT 1965

SOLAR FLARES 4 MIN

BY ATTACHING A MOTION PICTURE CAMERA TO A TELESCOPE, PHOTOGRAPHS CAN BE MADE OF BRIGHT AREAS APPEARING AND DISAPPEARING IN THE SUN.

PROD-FAC 8 COLOR SERIES-SS
DIST-FAC TC TN 1964

SOLAR PROMINENCES 3 MIN

TIME-LAPSE TELESCOPIC MOTION PICTURES OF SOLAR PROMINENCES TAKEN AT THE HIGH ALTITUDE OBSERVATORY IN BOULDER.

PROD-FAC 8 COLOR SERIES-SS
DIST-FAC TC TN 1964

200-INCH TELESCOPE AT MOUNT PALOMAR, THE 5 MIN

A MODEL OF THE 200-INCH HALE TELESCOPE AT MOUNT PALOMAR IS COMPARED WITH ACTUAL SHOTS TAKEN INSIDE AND OUTSIDE THE DOME. PROGRAM NOTES AVAILABLE FROM BBC.

PROD-GATE 8 BW SERIES-BBC
DIST-ICF TC TN 1966

X-15--MAN INTO SPACE 8 MIN

EFFORTS TO FLY MAN TO THE EDGE OF OUTER SPACE, SHOWING ROLE OF COMPUTERS.
NOT AVAILABLE FOR SALE

PROD-IBM 16 COLOR
DIST-IBM RE SOUND

WHAT ARE STARS MADE OF 16MIN

STORY OF AN ASTRONOMER INVESTIGATING A QUESTION ABOUT THE CHEMISTRY OF THE STARS.

PROD-VEF 8 COLOR
DIST-IFB FC TN

Chemistry

ACID BASE REACTION IN ELECTROLYSIS OF WATER 2 MIN

DEMONSTRATES THE ELECTROLYSIS OF WATER IN THE HOFFMAN APPARATUS. SHOWS BY ADDITION OF DYE INDICATORS THAT THE BASE ACCUMULATES AT THE NEGATIVE ELECTRODE AND THE ACID AT THE POSITIVE.

PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1960

ALKALI METAL REACTIONS WITH CHLORINE AND WITH WATER 4 MIN

NO INFORMATION AVAILABLE.

PROD-CHEM 8
DIST-CHEM TC TN

ANALYTICAL BALANCE--TARE WEIGHT DETERMINATION 3 MIN

POINTS OUTS THE CORRECT TECHNIQUE OF WEIGHING WITH ANALYTICAL BALANCE AND DEMONSTRATES WEIGHING OF A CONTAINER TO THE NEAREST 1/1000TH OF A GRAM.

PROD-EBF 8 COLOR
DIST-EBF TC TN

ANALYTICAL BALANCE--WEIGHING SAMPLE AND CONTAINER 3 MIN

ILLUSTRATES THE TECHNIQUE OF WEIGHING A SAMPLE AND CONTAINER.

PROD-EBF 8 COLOR
DIST-EBF TC TN

ARCHIMEDES' PRINCIPLE 7 MIN

DRAMATIZES THE PROBLEM THAT LED TO ARCHIMEDES' FAMOUS EXPERIMENTS ON BUOYANCY AND RECREATES EXPERIMENTS UNDER CONDITIONS THAT SHOW THE DEVELOPMENT OF HIS PRINCIPLE. DEMONSTRATES USE OF MODERN ARCHIMEDES BALANCE, AND MEASUREMENTS OF BUOYANT FORCE OF FLUID ON AN IMMERSED SOLID.
COLLABORATOR--O. W. ESHBACH

PROD-EBF 16 BW
DIST-EBF RE SOUND 1953

ATOMIC AND BONDING ORBITALS 4 MIN

THE PRINCIPLES OF S AND P ORBITAL HYBRIDIZATION TO SP3, SP2, AND SP ORBITALS ARE SHOWN.

PROD-SET G 8 COLOR
DIST-ACCC TC TN 1966

BOILING FROM A LIQUID-LIQUID INTERFACE 7 MIN

HIGH-SPEED PHOTOGRAPHY SHOWS DETAILS OF THE BOILING PROCESS AS WATER AND N-HEXANE BOIL FROM A MERCURY SURFACE.
NOT AVAILABLE FOR SALE

PROD-ANL 16 COLOR
DIST-ANL RE SILENT 1962

BOMB CALORIMETER, THE 9 MIN

STEP-BY-STEP DEMONSTRATION OF HOW HEAT OF COMBUSTION IS MEASURED WITH A BOMB CALORIMETER. OPERATION OF CALORIMETER EXPLAINED.

PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1961

BUILDING ATOM MODELS--ISOMERISM 6 MIN

USES THREE-DIMENSIONAL MODELS TO SHOW HOW DIFFERENT BONDING ARRANGEMENTS OF ATOMS PRODUCE DIFFERENT MOLECULES. IN TWO SEPARATE CARTRIDGES.

PROD-YALE 8,16 BW SERIES-YCF
DIST-AIM TC,RE TN 1960

CATALYSIS 10MIN

EXPLAINS HOW CATALYSTS MAY FUNCTION BY ABSORBING MOLECULES, ACTIVATING MOLECULES, FORMING AN INTERMEDIATE COMPOUND, OR STARTING A CHAIN REACTION. ILLUSTRATES APPLICATION OF NEGATIVE CATALYSTS IN THE MANUFACTURE OF RUBBER AND ANTI-KNOCK GASOLINE.
COLLABORATORS--HERMANN I. SCHLESINGER AND WARREN C. JOHNSON

PROD-EBF 16 BW
DIST-EBF RE SOUND

CHANGES ON MIXING 4 MIN

NO INFORMATION AVAILABLE

PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

CHEMICAL BONDING 16MIN

EXPLAINS BONDING IN TERMS OF ELECTRIC INTERACTIONS THAT CAUSE BONDING IN HYDROGEN MOLECULE. SHOWS RELEASE OF ENERGY WHEN H ATOMS COMBINE TO FORM MOLECULES ON PLATINUM SURFACE. ENERGY CHANGE RELATED TO SIMULTANEOUS ATTRACTION OF ELECTRONS BY TWO OR MORE NUCLEI. QUANTUM MECHANICAL VIEW OF ELECTRON DISTRIBUTION SHOWN.
COLLABORATOR--GEORGE C. PIMENTEL

PROD-CHEM 8 COLOR
DIST-MLA FC TN

COPPER SILVER ELECTROCHEMICAL CELL, THE 4 MIN

NO INFORMATION AVAILABLE.

PROD-CHEM 8
DIST-CHEM TC TN

CRYSTAL CLEAR 10MIN

ILLUSTRATES THE METHODS OF GROWING SYNTHETIC CRYSTALS.
NOT AVAILABLE FOR SALE

PROD-BTL 16 COLOR
DIST-BTL RE SOUND 1948

CRYSTAL GROWTH OF TUNGSTEN OXIDE 10MIN

NO INFORMATION AVAILABLE.

PROD-KYOTO 16 COLOR
DIST-KYOTO RE SILENT

CRYSTALS AT WORK 10MIN

DESCRIBES THE CHARACTERISTICS OF CRYSTALLINE SUBSTANCES AND ILLUSTRATES THE USE OF CRYSTALS IN INDUSTRY.

PROD-ALFI 16 BW
DIST-ALFI RE SOUND 1952

CUS PUPIL EXPERIMENT 4 MIN

NO INFORMATION AVAILABLE

PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

DENSITY 3 MIN

PRESENTS THE ACTUAL DERIVATION OF THE DENSITY OF A SOLID TOGETHER WITH THE QUALITATIVE MEASURE OF LIQUID DENSITY. DEFINES DENSITY AS WEIGHT PER UNIT VOLUME. ILLUSTRATES THE RELATIONSHIP OF THE DENSITY OF A SOLID TO A LIQUID.

PROD-EBF 8 COLOR SERIES-CIC
DIST-EBF TC TN 1964

DR. BLACK'S OBSERVATIONS ON HEAT 7 MIN

PRESENTS SOME FUNDAMENTAL EXPERIMENTS ON HEAT AND CALORIMETRY--DIFFERENTIATION OF HEAT AND TEMPERATURE, THERMAL EQUILIBRIUM, HEAT CAPACITY, AND HEATING RATES USING EXCERPTS FROM BLACK'S LECTURES.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1963

ELECTRIC INTERACTIONS IN CHEMISTRY 21MIN

SENSITIVE BALANCE MEASURES THE FORCE BETWEEN TWO CHARGED SPHERES AND SUGGESTS THAT THE FORCE TIMES THE SQUARE OF DISTANCE IS CONSTANT.
COLLABORATORS--J. LELAND HOLLENBERG AND J. ARTHUR CAMPBELL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

ELECTROCHEMICAL CELL, AN 4 MIN

NO INFORMATION AVAILABLE.
PROD-CAMP 8 COLOR
DIST-ACCC TC TN 1967

ELECTROCHEMICAL CELL-ANIMATED MECHANISM, AN 4 MIN

NO INFORMATION AVAILABLE.
PROD-CHEM 8
DIST-CHEM TC TN

ELECTRODES AND CELL PROCESSES ILLUSTRATED TO SHOW 22MIN

NATURE OF THE ELECTRODE REACTIONS, THE MOTION OF THE ELECTRON AND ION CURRENTS, AND THE RELATIONSHIP BETWEEN CONCENTRATIONS AND CELL VOLTAGE.
COLLABORATORS--J. ARTHUR CAMPBELL AND JUNE S. EWING
PROD-CHEM 8 COLOR
DIST-MLA FC TN

ELECTROLYSIS 4 MIN

CONDUCTION OF ELECTRICITY THROUGH A LIQUID
PROD-LOEW 16 BW SERIES-PL
DIST-MGHT RE SOUND 1950

ELECTROLYSIS OF BRINE, THE 9 MIN

PRESENTS A SIMPLE DEMONSTRATION OF THE ELECTROLYSIS OF BRINE AND SHOWS ITS COMMERCIAL APPLICATION.
PROD-YALE 16 COLOR
DIST-AIM RE SOUND 1965

ELECTRONEGATIVITY 4 MIN

DEFINES THE ELECTRONEGATIVITY SCALE AND RELATES IT TO THE PERIODIC TABLE. USING CHLORINE, BROMINE, IODINE, AND THEIR SALTS, THE REPLACEMENT OF A LESS BY A MORE ELECTRONEGATIVE HALOGEN IS DEMONSTRATED.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1963

ELECTRONIC SPECTRA OF 016 AND 018 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

ENERGY TRANSFORMATION I 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

ENERGY TRANSFORMATION II 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

EQUILIBRIUM 24MIN

ANSWERS THREE QUESTIONS--WHAT IS CHEMICAL EQUILIBRIUM, HOW IS IT RECOGNIZED, AND HOW IS IT EXPLAINED. DEMONSTRATES DYNAMIC MOLECULAR BEHAVIOR OF SUBSTANCES AT EQUILIBRIUM IN A CLOSED SYSTEM.
COLLABORATOR--GEORGE C. PIMENTEL
PROD-CHEM 8 COLOR
DIST-MLA FC TN

FAST REACTION--MERCURY AND SILVER NITRATE 5 MIN

MERCURY IS SQUEEZED FROM A HOOK-NECK DROPPER INTO A BEAKER OF SILVER NITRATE, FORMING A GRAPE-SIZED SILVER BALL. THE PHYSICAL CHARACTERISTICS OF THE BALL ARE EXAMINED.
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1963

GAS REACTION (AMMONIA AND HYDROGEN CHLORIDE) 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

GAS REACTION (HYDROGEN AND OXYGEN) 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

GRAM-ATOMS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

GROWTH OF ICE FILAMENTS, THE (FRENCH) 9 MIN

GROWTH OF ICE FILAMENTS ON BARE, DAMP EARTH WHEN AIR TEMPERATURE DROPS BELOW ZERO DEGREES C. FORMATION AND GROWTH OF ICE FILAMENTS ON IRON OXIDE. PARTICLES PLACED IN AN ATMOSPHERE SATURATED IN RELATION TO THE ICE.
PROD-SET M 16 COLOR
DIST-FREM RE SOUND 1964

HIGH TEMPERATURE RESEARCH 19MIN

ILLUSTRATES THE SPIRIT OF RESEARCH BY FOLLOWING SCIENTISTS WHO ARE STUDYING THE BOND STRENGTH OF GASEOUS TITANIUM MONOSULFIDE.
COLLABORATOR--PAUL W. GILLES
PROD-CHEM 8 COLOR
DIST-MLA FC TN

HYDROGEN GENERATOR--MARSH TEST 7 MIN

DEMONSTRATES EFFECTIVE AND SAFE METHOD FOR SETTING UP A HYDROGEN GENERATOR WHICH IS USED TO CONDUCT THE MARSH TEST FOR ARSENIC.
PROD-YALE 16 BW SERIES-YCF
DIST-AIM RE SOUND 1960

INFRARED SPECTRA AND MOLECULAR STRUCTURE 4 MIN

NO INFORMATION AVAILABLE.
PROD-SLAB 8 COLOR
DIST-ACCC TC TN 1967

INTERPRETATION OF VIBRATION SPECTRA 8 MIN

NO INFORMATION AVAILABLE. IN TWO SEPARATE CARTRIDGES.
PROD-SLAB 8 COLOR
DIST-ACCC TC TN 1967

INTRODUCTION TO REACTION KINETICS 13MIN

ANIMATED. ILLUSTRATES THE MECHANISMS OF SOME SIMPLE CHEMICAL REACTIONS AND EXPLAINS THE EFFECT OF TEMPERATURE, ACTIVATION ENERGY, GEOMETRY OF COLLISION AND CATALYSIS ON RATE OF REACTION. POTENTIAL ENERGY CURVES CLARIFY THE RELATIONSHIP BETWEEN THE ENERGY REQUIRED FOR A REACTION TO OCCUR AND THE RELATIVE POSITION OF THE REACTION PARTICLES BEFORE, DURING, AND AFTER THE COLLISION.
COLLABORATOR--HENRY EYRING
PROD-CHEM 8 COLOR
DIST-MLA FC TN

IONIZATION ENERGIES 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

IONIZATION OF GASES (FRENCH) 4 MIN

EXPERIMENT ILLUSTRATING IONIZATION ACCOMPANYING A CHEMICAL REACTION AT ELEVATED TEMPERATURE. SHOWS CONVECTION ABOVE A FLAME AND CAPTURE OF IONS WITH AN ELECTRIC CONDENSER, AN INTERFEROMETER FOR VISUALIZING CONVECTION FLOWS AND THE CONFIGURATION OF FLOWS BETWEEN THE PLATES OF CHARGED OR DISCHARGED CONDENSERS.
PROD-SFRS 16 COLOR
DIST-SFRS RE SILENT 1961

ION REMOVAL BY METATHESIS 4 MIN

USES DYE INDICATORS AND ELECTRICAL CONDUCTIVITY AS TESTS FOR NEUTRALIZATION OF BARIUM HYDROXIDE BY SULFURIC ACID. KEY STEPS REPEATED AND STUDENT ASKED TO OBSERVE AND EXPLAIN PHENOMENON ON WORKSHEET.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1962

LEAD BROMIDE ELECTROLYSIS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

LE CHATELIER'S PRINCIPLE 3 MIN

IN STOP-MOTION PHOTOGRAPHY, A WEIGHTED WIRE IS SHOWN CUTTING THROUGH A BLOCK OF ICE WHICH REFREEZES AFTER THE WIRE PASSES THROUGH. A DIAGRAM EXPLAINS THE PHENOMENON BY RELATING WATER-ICE EQUILIBRIUM TO THE PRESSURE.
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1960

LIQUID/GAS EQUILIBRIUM 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 BW SERIES-CHEM
DIST-DIL TC TN 1966

LIQUID-LIQUID DISPERSIONS 10MIN

SHOWS DISPERSION CHARACTERISTICS OF OIL-WATER EMULSION AND THE MEANS FOR CONTROLLING EMULSION BEHAVIOR.
NOT AVAILABLE FOR SALE
PROD-ANL 16 BW
DIST-ANL RE SILENT 1956

MASS SPECTROMETRIC DETERMINATION OF MASS AND RELATIVE ABUNDANCES OF ISOTOPES OF AN ELEMENT 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

MECHANISM OF CHROMATOGRAPHIC SEPARATION 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

MELTING POINTS (RELATION TO PERIOD TABLE) 3 MIN

CORRELATES MELTING POINTS OF ELEMENTS WITH POSITION IN PERIODIC TABLE THROUGH ANIMATED THREE-DIMENSIONAL BAR GRAPH.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1961

METALS AND NON-METALS 9 MIN

SHOWS CHARACTERISTIC PROPERTIES THAT DISTINGUISH METALS FROM NON-METALS. PERIODIC TABLE IS USED TO ORGANIZE THIS INFORMATION.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1961

MOLECULAR THEORY OF MATTER 10MIN

DIFFUSION OF GASES, EVAPORATION OF LIQUIDS, TRANSFORMATION OF LIQUIDS INTO SOLIDS EXPLAINED. ILLUSTRATES FORCE EXERTED BY MOLECULAR MOTION AND GIVES MICROSCOPIC VIEW OF BROWNIAN MOVEMENT.
PROD-EBF 16 BW
DIST-EBF RE SOUND

MOLECULAR VIBRATIONS USING MODELS 4 MIN

NO INFORMATION AVAILABLE.
PROD-CAMP 8 COLOR
DIST-ACCC TC TN 1967

MOLECULAR WEIGHT OF SOLUTES 8 MIN

DISCUSSES METHODS FOR DETERMINING MOLECULAR WEIGHTS OF NON-VOLATILE SOLUTES. DETERMINATIONS ARE MADE USING A AN ORGANIC SOLVENT AND WATER. CONVENTIONAL CALCULATIONS ARE DICUSSED.
COLLABORATOR--THOMAS SUMNER
PROD-CORF 16 C,BW
DIST-CORF RE SOUND

MOLECULES 8 MIN

ELEMENTARY EXPLANATION OF THE NOTION OF A MOLECULE. WATER IN A VOLTMETER GIVES OFF GAS IN THE FORM OF BUBBLES. THIS IS BROKEN DOWN INTO ITS COMPONENTS WHICH ARE MONOVALENT AND BIVALENT ATOMS.
PROD-ASO 16 COLOR
DIST-OBAF RE SOUND 1959

MOVEMENT IN CRYSTAL GROWTH 5 MIN

DEMONSTRATES FRACTIONAL CRYSTALLIZATION FOR THE PURIFICATION OF AN ORGANIC COMPOUND. SHOWS CRYSTALS ROLL AND FLY APART AS THEY GROW - CRYSTAL STRAINS ARE SHOWN IN POLARIZED ILLUMINATION.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1965

MOVEMENT OF MOLECULES 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

OPERATION OF THE METTLER BALANCE 4 MIN

NO INFORMATION AVAILABLE.
PROD-SLAB 8 COLOR
DIST-ACCC TC TN 1967

PART III--CHARLES' LAW 5 MIN

NO INFORMATION AVAILABLE.
PROD-ZUR 8,16 BW SERIES-TOKT
DIST-ZUR TC,RE 1966

PART IV--EFFECT OF LEAKS 5 MIN

NO INFORMATION AVAILABLE.
PROD-ZUR 8,16 BW SERIES-TOKT
DIST-ZUR TC,RE 1966

PLASTICS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

POLARIZATION INTERFEROMETRY APPLIED TO INVESTIGATING SOME PHENOMENA LINKED WITH SURFACE TENSION 8 MIN

DEFORMATION OF LIQUID SURFACES IN CONTACT WITH SOLIDS, AND MENISCUS FORMATION. INVESTIGATES THE WETTING OF SUBMERGED OBJECTS. (FRENCH)
PROD-FRAN 16 COLOR
DIST-FREM RE SOUND 1966

POLYMER SCIENCE 4 MIN

THREE FILMS ILLUSTRATING THE PHYSICAL-CHEMICAL PROPERTIES OF HIGH POLYMERS.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

PRECISION IN VOLUME MEASUREMENT 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

PRIMARY CELL, THE 4 MIN

SHOWS THE ACTION OF A SIMPLE CELL, POLARIZATION, AND ITS REMEDY, AS WELL AS AMALGAMATION AND ITS ADVANTAGE.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

PROPERTIES OF A COVALENTLY BONDED MOLECULE, THE 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-ERF TC TN 1967

PROPERTIES OF AN IONIC COMPOUND 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

PROPERTIES OF MIXTURES AND COMPOUNDS 4 MIN

ILLUSTRATES THAT ''CHANGE'' MUST BE DESCRIBED IN TERMS OF CHARACTERISTIC PROPERTIES. IRON FILINGS AND SULFUR POWDER MIXED TOGETHER ARE DISTINGUISHABLE THROUGH TESTING, BUT WHEN HEATED TO IGNITION THE RESULTING COMPOUND DOES NOT RESPOND TO SIMILAR TESTS.
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1963

PROTON MOTIONS IN ICE 5 MIN

ANIMATED. EXPLAINS THE DIELECTRIC AND CONDUCTION BEHAVIOR OF ICE CRYSTALS IN TERMS OF TWO KINDS OF PROTON MOTION ARISING FROM THERMAL AGITATION--BJERRUM FAULTS AND PROTON JUMPS.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1962

RATE OF COMBUSTION 3 MIN

RAPID OXIDATION OF A FUEL IS EXPLAINED THROUGH CLOSE-UP PHOTOGRAPHY, ANIMATION AND SUBTITLES. FIVE GENERAL FACTORS WHICH DETERMINE THE RATE OF COMBUSTION ARE SHOWN.
PROD-SUTH 8 COLOR
DIST-SUTH TC TN

RESEARCH PROBLEM--INERT GAS COMPOUNDS, A 19MIN

SHOWS A TRAIN FOR THE PYROLYTIC PREPARATION OF XEFY, ITS REACTION WITH WATER, DETONATION OF A CRYSTAL OF XEO, AND THE PREPARATION OF KRYPTON DIFLUORIDE, TRACING THE WAY IN WHICH IT WAS FIRST SYNTHESIZED. COLLABORATORS--GEORGE C. PIMENTEL AND J. J. TURNER
PROD-CHEM 8 COLOR
DIST-MLA FC TN

SECONDARY CELL, THE 2 MIN

DESCRIBES THE ACTION OF A LEAD ACCUMULATOR AND DEMONSTRATES BY MEANS OF ANIMATION THE CHANGES WHICH TAKE PLACE ON CHARGE AND DISCHARGE.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

SHAPES AND POLARITIES OF MOLECULES 18MIN

ELECTRIC EFFECTS, INCLUDING DEFLECTIONS OF STREAMS OF LIQUIDS BY CHARGED ROD AND CHANGES IN CHARGING TIME OF CAPACITOR OBSERVED. CONCEPTUAL MODEL DEVELOPED TO EXPLAIN RESULTS. BOND POLARITY AND MOLECULAR SHAPE CONSIDERED AND MOLECULAR POLARITY PREDICTED. MOLECULAR DIPOLE MODEL USED TO EXPLAIN DIFFERENCES IN SOLUBILITY, CONDUCTIVITY, AND CHEMICAL REACTIVITY. COLLABORATOR--DAVID DOWS
PROD-CHEM 8 COLOR
DIST-MLA FC TN

SILVER-HYDROGEN ELECTROCHEMICAL CELL, A 4 MIN

NO INFORMATION AVAILABLE.
PROD-CAMP 8 COLOR
DIST-ACCC TC TN 1967

SINGLE PAN SARTORIUS BALANCE, THE 4 MIN

NO INFORMATION AVAILABLE.
PROD-SLAB 8 COLOR
DIST-ACCC TC TN 1967

SLOW REACTION--IRON AND OXYGEN 2 MIN

AS STEEL WOOL RUSTS FOR A 36-HOUR PERIOD, STOP MOTION PHOTOGRAPHY OBSERVES OXYGEN COMBINING WITH THE IRON IN AN INVERTED, WATER-SEALED TUBE. (IN SAME CARTRIDGE AS VERY FAST REACTION.)
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1963

SOLID/LIQUID EQUILIBRIUM 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 BW SERIES-CHEM
DIST-DIL TC TN 1966

SOLUTION, EVAPORATION, AND CRYSTALLIZATION 3 MIN

SULFUR POWDER IS DISSOLVED WITH CARBON DISULFIDE, THEN ALLOWED TO EVAPORATE IN A HOOD. STOP-MOTION AND CLOSE-UP PHOTOGRAPHY ARE USED TO OBSERVE THE FORMATION OF CRYSTALS.
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1963

SOLUTIONS 3 MIN

ANIMATED. EXPLAINS THE MOLECULAR AND IONIC PROCESS OF WATER-DISSOLVING SALT CRYSTALS.
PROD-SUTH 8 COLOR
DIST-SUTH TC TN

STRUCTURE OF A COVALENT MOLECULE C-CL4 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

STRUCTURE OF AN IONIC CRYSTAL, THE 4 MIN

NO INFORMATION AVAILABLE.
PROD-HB 8 COLOR
DIST-EBF TC TN 1967

SULFUR, ITS PHYSICAL STATES AND PROPERTIES 9 MIN

SHOWS THAT THE PHYSICAL TRANSFORMATIONS OF SULFUR ARE FUNCTIONS OF BOTH TEMPERATURE AND TIME. CHANGES ARE EXPLAINED IN MOLECULAR TERMS BY ANIMATED SEQUENCES.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1961

SULPHUR CRYSTALS 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

SURFACE OXIDATION IN COPPER 9 MIN

EXPERIMENTS PERFORMED ON COPPER AT HIGH TEMPERATURE AND LOW OXYGEN PRESSURE ENABLE ONE TO FOLLOW THE DEVELOPMENT OF OXIDE AND TO DEDUCE THE MAIN CHARACTERISTICS.
PROD- 16 COLOR
DIST- RE SOUND 1962

THIN LAYER CHROMATOGRAPHY 6 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC FC TN 1967

TRANSURANIUM ELEMENTS 23MIN

REVIEWS THE HISTORICAL PROBLEM OF THE PLACEMENT OF TRANSURANIUM ELEMENTS IN PERIODIC TABLE - SHOWS THAT NEPTUNIUM, PLUTONIUM, AND AMERICIUM HAVE CHEMICAL PROPERTIES SIMILAR TO URANIUM - DEMONSTRATES HOW THE ION-EXCHANGE SEPARATION TECHNIQUE IS USED IN IDENTIFICATION - DISCUSSES THE METHODS USED IN SYNTHESIS OF ELEMENTS 102 AND 103.
COLLABORATOR--GLENN T. SEABORG
PROD-CHEM 8 COLOR
DIST-MLA FC TN

VAPOR PRESSURE 7 MIN

SHOWS THAT THE EQUILIBRIUM IN A CLOSED CONTAINER OF SOLID IODINE AND ITS VAPOR ARE FUNCTIONS OF TEMPERATURE. MEASURABLE VAPOR PRESSURE IS EXPLAINED BY MOLECULAR MOTION. VAPOR PRESSURE MEASUREMENT WITH A MERCURY BAROMETER IS DEMONSTRATED WITH FOUR LIQUIDS.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1963

VERY FAST REACTION--AMMONIUM DICTROMATE 1 MIN

ORANGE AMMONIUM DICTROMATE CRYSTALS PRODUCE A MINIATURE VOLCANO WHEN IGNITED, LEAVING A CONE OF GRAY-GREEN ASH. (IN A CARTRIDGE WITH SLOW REACTION)
PROD-YALE 8,16 COLOR SERIES-YCF
DIST-AIM TC,RE TN 1963

VIBRATION OF MOLECULES 12MIN

ANIMATED. SHOWS RELATIONSHIP BETWEEN THE STRUCTURE OF A MOLECULE AND ITS VIBRATIONAL MOTIONS, PARTICULARLY IN WATER, CARBON DIOXIDE, AND METHANE. ILLUSTRATES EFFECT OF MOLECULAR COLLISION OR ABSORPTION OF LIGHT ON VIBRATIONS. DETERMINATION OF NUMBER OF POSSIBLE VIBRATIONS AND ANALYSIS OF COMPLEX VIBRATIONS ARE EXPLAINED IN TERMS OF SIMPLE HARMONIC MOTIONS.
PROD-CHEM 8 COLOR
DIST-MLA FC TN

VOLUME 3 MIN

DEVELOPS THE CONCEPT OF VOLUME AS A THREE-DIMENSIONAL MEASURE. ILLUSTRATES BASIC VOLUMES USED IN CHEMICAL LABORATORY PRACTICE.
PROD-EBF 8 COLOR SERIES-CIC
DIST-EBF TC TN 1964

VOLUME CHANGES ON MIXING LIQUIDS I 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

VOLUME CHANGES ON MIXING LIQUIDS II 4 MIN

NO INFORMATION AVAILABLE
PROD-UNESCO 8 BW SERIES-PPC
DIST-WAT TC TN 1966

VOLUMETRIC MEASUREMENTS 9 MIN

DEALS WITH DETERMINATION OF THE VOLUME OF SOLIDS AND LIQUIDS. PROPER USE OF SCALE, BURET, GRADUATE CYLINDER SHOWN IN DETAIL.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

WATER ASPIRATOR 1 MIN

ANIMATED. USES A TRANSPARENT MODEL TO SHOW HOW THE BERNOULLI EFFECT FUNCTIONS IN THIS DEVICE. DEFINES THE MODERN UNIT OF VACUUM MEASUREMENT, THE TORR.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

XENON TETRAFLUORIDE 6 MIN

SHOWS PREPARATION OF THE COMPOUND, ALLOWING STUDENT TO VIEW FORMATION OF CRYSTALS. DISCUSSES TESTS TO SUBSTANTIATE EXACT NATURE OF THE COMPOUND.
PROD-ANL 16 COLOR
DIST-CALVIN RE SOUND 1962

Mathematics

CLASSIFYING PATHS I 4 MIN

USING LETTERS TO CLASSIFY POSSIBLE PATHS FROM ONE POINT TO ANOTHER ON A GRID.

PROD-GATE 8 BW SERIES-MT
DIST-GATE TC TN 1967

CLASSIFYING PATHS II 4 MIN

CLASSIFYING PATHS BETWEEN ONE POINT AND ANOTHER ON A GRID ACCORDING TO THEIR OVERALL LENGTH.

PROD-GATE 8 BW SERIES-MT
DIST-GATE TC TN 1967

CONFORMAL REPRESENTATION,THE--W = 1/Z 6 MIN

ANIMATED. REPRESENTS W = 1/Z.
NOT AVAILABLE FOR SALE

PROD-IWF 16 BW
DIST-PURDUE RE SILENT

CONFORMAL REPRESENTATION,THE--W = Z + 1/Z 3 MIN

ANIMATED. REPRESENTS W = Z + 1/Z.
NOT AVAILABLE FOR SALE

PROD-IWF 16 BW
DIST-PURDUE RE SILENT

COSINE FUNCTION 3 MIN

TRIGONOMETRICAL CIRCLES. THE COSINE IS VISUALIZED - ITS VARIATION AS A FUNCTION OF THE ANGLE IS SHOWN. SPECIAL VALUES FOR ANGLES K PI/2 ARE CONSIDERED.

PROD-NFBC 8,8S,16 COLOR
DIST-EBF TC,RE TN 1965

DANCE SQUARED 4 MIN

COMPONENT PARTS OF A SQUARE, PRESENTED AS BRIGHTLY-COLORED SHAPES, MOVE ABOUT IN RHYTHMIC PATTERNS, DIVIDING, SUB-DIVIDING, AND GYRATING. ILLUSTRATES GEOMETRIC CONCEPTS.

PROD-NFBC 8,16 COLOR
DIST-EBF TC,RE TN 1961

DOT LATTICE, A--PATTERNS OF NUMBERS IN SHAPES 4 MIN

A SET OF SQUARES DEVELOPS IN DIFFERENT WAYS ON A DOT LATTICE AND STUDENTS CAN SET DOWN THE APPROPRIATE NUMBER OF PATTERNS WHICH SUGGEST THEMSELVES.

PROD-GATE 8 BW SERIES-MT
DIST-GATE TC TN 1967

ELLIPSE AS A CONICAL SECTION, THE (GERMAN) 10MIN

GENERATING A CONE. ELLIPSE AS CONICAL SECTION. PROPERTIES OF THE FOCI. GRAPH OF AN ELLIPSE DEDUCED FROM PROPERTIES OF THE FOCI. PLOTTING A GRAPH BY MEANS OF A TAUT THREAD. THE ECCENTRICITY OF THE ELLIPSE AND APPLICATION TO ITS GRAPH.

PROD-IWF 16 BW
DIST-FWU RE SILENT 1942

FORMULAS IN MATHEMATICS 10MIN

CONSTRUCTED AROUND D=RT, ILLUSTRATED GRAPHICALLY AND PICTORIALLY.

PROD-IFB 16 COLOR
DIST-IFB RE SOUND

GEOMETRY--CURVES AND CIRCLES 10MIN

INTRODUCES IDEA OF THE CURVE. DEFINES AND DESCRIBES THE PROPERTIES OF DIFFERENT KINDS OF CURVES.

PROD-BOUN 16 COLOR
DIST-FAC RE SOUND 1965

GEOMETRY--LINES AND SHAPES 10MIN

INTRODUCES IDEA OF A LINE, DEFINES PROPERTIES OF A LINE AND A LINE SEGMENT, AND SHOWS THE SHAPES FORMED BY JOINING LINE SEGMENTS.
CONSULTANT--GEORGE ARBOGAST

PROD-BOUN 16 COLOR
DIST-FAC RE SOUND 1965

GEOMETRY--POINTS, ANGLES, LINES AND TIGERS 9 MIN

ANIMATED. INTRODUCES BASIC DEFINITIONS OF GEOMETRIC TERMS AND ILLUSTRATES PRINCIPLES AND RELATIONSHIPS OF GEOMETRY.

PROD-BFI 16 COLOR
DIST-BFI RE SOUND 1965

INTERSECTION OF SURFACES 9 MIN

EXPLAINS PRINCIPLES FOR FINDING LINES OF INTERSECTION BETWEEN INTERSECTION OF 2 PRISMS, 2 CYLINDERS, CYLINDER AND CONE. INCLUDES FOUR PROBLEMS.

PROD-PURDUE 16 BW
DIST-PURDUE RE SILENT

INVERSES AND IDENTITIES (NUMBERS) 4 MIN

INTUITIVE APPROACH TO INVERSES AND IDENTITIES INVOLVING ''COLLIDING'' NUMBERS.

PROD-GATE 8 BW SERIES-MT
DIST-GATE TC TN 1967

INVERSES AND IDENTITIES (PATHS) 4 MIN

DESCRIPTIONS OF PATHS AND THEIR OPPOSITES ON A GRID. A FIRST LOOK AT IDENTITY.

PROD-GATE 8 BW SERIES-MT
DIST-GATE TC TN 1967

PARABOLA AS A CONICAL SECTION, THE (GERMAN) 6 MIN

GENERATING THE PARABOLA AS A CONICAL SECTION. PROPERTIES OF THE FOCUS. PLOTTING THE GRAPH OF THE PARABOLA, USING A TAUT THREAD. PROPERTIES OF FOCAL SEGMENTS.

PROD-FWU 16 BW
DIST-FWU RE SILENT 1942

PASCAL'S TRIANGLE 4 MIN

BUILDS UP THE TRIANGLE, HIGHLIGHTS SOME OF ITS MORE IMPORTANT PROPERTIES AND EXPLORES SOME LESS FAMILIAR PATTERNS.

PROD-GATE 8 COLOR SERIES-MT
DIST-GATE TC TN 1967

PROGRAMMING LANGUAGES 5 MIN

DESIGNED AS INTRODUCTION TO PROGRAMMING COMPUTER LANGUAGES. TOUCHES ON EVALUTION OF NEW SDC COMPILER LANGUAGE CALLED JOVIAL.

PROD-SDC 16 COLOR
DIST-SDC RE SOUND

PYTHAGORAS 4 MIN

A RIGHT TRIANGLE, WITH A HYPOTENUSE OF CONSTANT LENGTH, ROTATES ABOUT A FIXED POINT WHILE LINE SEGMENTS FORMING OTHER TWO SIDES SHORTEN AND LENGTHEN IN OPPOSITE PHASES. SQUARES ARE ADDED TO THE THREE SIDES AND THEIR CHANGING RELATIONSHIPS ARE OBSERVED.

PROD-NFBC 8 COLOR SERIES-MATH
DIST-NFBC TC TN 1965

PYTHAGOREAN THEOREM--THE COSINE FORMULA 6 MIN

SHOWS HOW THE PYTHAGOREAN THEOREM MAY BE APPLIED TO ACUTE ANGLED TRIANGLES IN ADDITION TO RIGHT TRIANGLES, AND HOW THIS LEADS TO THE COSINE FORMULA. ANIMATED DRAWINGS PROVE THAT AS THE ACUTE ANGLE APPROACHES A RIGHT ANGLE, ITS COSINE APPROACHES ZERO.

PROD-ZORA 16 BW
DIST-CORF RE SOUND 1960

PYTHAGOREAN THEOREM--PROOF BY AREA 6 MIN

ANIMATED. SHOWS HOW THE SQUARE OF EACH SIDE OF A RIGHT TRIANGLE MAY BE TRANSFORMED TO A PARALLELOGRAM OF EQUAL AREA, AND HOW THESE MAY BE PROVED TO BE EQUAL IN AREA TO THE SQUARE OF THE HYPOTENUSE.

PROD-ZORA 16 BW
DIST-CORF RE SOUND 1960

REFLECTION PROPERTY OF THE ELLIPSE, THE 1 MIN

ANIMATED. COMPLETES THE PROOF THAT LIGHT RAYS FROM ONE FOCUS OF AN ELLIPTICAL (OR ELLIPSOIDAL) MIRROR ARE REFLECTED THROUGH THE OTHER FOCUS.

PROD-GATE 8 COLOR
DIST-GATE TC TN

SIMPLE HARMONIC MOTION (PROD-TECH) 2 MIN

ANIMATED. ILLUSTRATES HOW THIS OSCILLATORY MOVEMENT CAN BE DERIVED FROM THE UNIFORM MOTION OF A PARTICLE IN A CIRCULAR PATH.

PROD-TECH 8 COLOR
DIST-EFVA TC TN 1962

SINE FUNCTION 3 MIN

CIRCULAR MOTION OF A RADIUS--CORRESPONDING MOTION OF THE PROJECTION. DEMONSTRATION OF THE RATIO PROJECTION TO RADIUS--VALUE OF THIS RATIO FOR THE ANGLES K PI/2 SHOWN.

PROD-NFBC 8,8S,16 COLOR SERIES-MATH
DIST-EBF TC,RE TN 1965

SINE WAVE, THE 2 MIN

ANIMATED. ILLUSTRATES THE WAY IN WHICH THE MOVEMENT OF A POINT IN SIMPLE HARMONIC MOTION IS ASSOCIATED WITH THE CURVE KNOWN AS SINE WAVE.

PROD-TECH 8 COLOR
DIST-EFVA TC TN 1962

SLIDE RULE, THE--CI SCALE 4 MIN

SHOWS THAT THE READINGS ON THE CI SCALE ARE THE RECIPROCALS OF THOSE ON THE C AND D, AND THAT THE RESULTING SCALE IS A C OR D SCALE IN REVERSE. SHOWS HOW TO OBTAIN RECIPROCALS OF TWO-DIGIT AND THREE-DIGIT NUMBERS. MULTIPLICATION ON THE CI SCALE IS EXPLAINED AND COMPARED TO DIVISION ON THE C SCALE. CONVERSELY, DIVISION ON CI IS SEEN AS THE EQUIVALENT OF MULTIPLICATION ON C.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--DIVISION, C AND D SCALES 3 MIN

DIVISION IS SHOWN AS THE SUBTRACTION OF LENGTHS. A SIMPLE EXAMPLE (6/3 = 2) AND A MORE COMPLICATED EXAMPLE INVOLVING TWO THREE-DIGIT NUMBERS ARE WORKED. SHOWS HOW TO CHOOSE THE APPROPRIATE SLIDE INDEX.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--MULTIPLICATION, C AND D SCALES 4 MIN

A SIMPLE EXAMPLE (2 X 3 = 6) IS DEMONSTRATED FOLLOWED BY A PAIR OF TWO-DIGIT NUMBERS AND A PAIR OF THREE-DIGIT NUMBERS. POSITIONING THE DECIMAL POINT IS DISCUSSED AND ILLUSTRATED. CONSIDERS THE PROBLEM OF HOW TO CHOOSE THE APPROPRIATE SLIDE INDEX.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--READING AND HANDLING 4 MIN

THIS FILM BEGINS WITH THE ASSEMBLY OF A RULE FROM ITS LABELED PARTS. THE LOCATION OF THE C AND D SCALES IS COMPARED ON VARIOUS ELEMENTARY RULES IN COMMON USE. THE CAMERA MAKES TWO SLOW TRANSVERSES OF THE INDEXED RULE TO ILLUSTRATE HOW TO READ TWO-DIGIT AND THREE-DIGIT NUMBERS RESPECTIVELY. THE SCALE SUBDIVISIONS ARE EXPLAINED, AND 24 READINGS ARE TAKEN.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--SQUARES, CUBES, AND ROOTS 4 MIN

THE SINGLE DIGIT NUMBERS ON THE A SCALE ARE SHOWN TO BE THE SQUARES OF THOSE ON D. AN EXAMPLE IS WORKED IN POSITIONING THE DECIMAL POINT BY EXPRESSING NUMBERS IN POWERS OF TEN IS EXPLAINED. SHOWS HOW TO CHOOSE THE CORRECT HALF OF THE A SCALE TO FIND A SQUARE ROOT. THE K SCALE IS IDENTIFIED AND USED TO CUBE THREE NUMBERS.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--THREE-DIGIT PRACTICE 4 MIN

CLOSE-UPS OF A THREE-DIGIT NUMBER ON THE C AND D SCALES - STUDENT READS - ANSWER FLASHES ON SCREEN.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--TWO-DIGIT PRACTICE 4 MIN

DESIGNED TO GIVE STUDENT PRACTICE IN READING AND INTERPRETING NUMBERS OF THE C AND D SCALES.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

SLIDE RULE, THE--WHY IT WORKS 4 MIN

REVIEWS THE CONCEPTS OF NUMBER, BASE, AND EXPONENT, AND ILLUSTRATES THE ADDITION OF EXPONENTS TO ACHIEVE MULTIPLICATION.
COLLABORATOR--R. B. WILLIAMSON

PROD-EFL 8,8S,16 COLOR SERIES-SR
DIST-EFL TC,RE TN 1967

STRING PROPERTY OF THE ELLIPSE, THE 2 MIN

ANIMATED. ILLUSTRATES THE CONSTRUCTION OF THE ELLIPSE AS THE LOCUS OF A POINT SUCH THAT THE SUM OF ITS DISTANCES FROM THE FOCI IS CONSTANT.

PROD-GATE 8 COLOR
DIST-GATE TC TN

TANGENCY 8 MIN

CONSIDERS THE MOTION OF A STRAIGHT LINE WITH RESPECT TO A CIRCLE.

PROD-ATAM 16 BW
DIST-ATAM RE SILENT 1958

TANGENT FUNCTION 2 MIN

CIRCULAR MOTION OF A RADIUS AND DEMONSTRATION OF THE TANGENT SEGMENT - DEMONSTRATION OF RATIO VALUES FOR FOR ANGLES WHICH ARE INTEGRAL MULTIPLES OF PI/2.

PROD-NFBC 8 COLOR SERIES-MATH
DIST-EBF TC TN 1965

TRANSFORMATION GEOMETRY SERIES

FIVE FILMS ON TRANSFORMATION IN TWO-DIMENSIONAL EUCLIDEAN SPACE. IN EACH LOOP, ELEMENT TRANSFORMED IS UNIQUE--IT NEVER APPEARS AS A CONSEQUENCE OF SIMULTANEOUS TRANSFORMATIONS - OUTLINE SHAPES ARE USED TO INDICATE STAGES IN A SEQUENCE OF TRANSFORMATIONS WHERE REQUIRED PROCESS OF TRANSFORMATION IS INDEPENDENT OF THE TRANSFORMATION. SEQUENCES AT THE BEGINNING OF EACH FILM HAVE NO CONSTRUCTION LINES--SIMPLY THE TRANSFORMATIONS. CHANGE IN APPEARANCE OF THE ELEMENT IS SHOWN ONLY THROUGH THE TRANSFORMATION INVOLVED. COLLABORATORS--W. M. BROOKES AND I. HARRIS

PROD-EOTHEN 8 BW
DIST-FAC TC TN 1967

Lab, Apparatus, and Miscellaneous

AC DYNAMO 3 MIN

MODEL SHOWS HOW ELECTRICITY IS GENERATED WITH A MAGNET AND COIL. THE CURRENT IS RECORDED ON A METER AND INTERPRETED ON A GRAPH.
PROD-WWP 8 COLOR
DIST-WWP TC TN

ACTIVE ELEMENT, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

AIR SUPPORTS WATER IN AN INVERTED TUMBLER 2 MIN

WATER IS SUPPORTED IN AN INVERTED GLASS ILLUSTRATING ATMOSPHERIC PRESSURE.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

AMPLITUDE MODULATOR, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

ANALYSIS OF SOLIDS 5 MIN

SHOWS HOW A MASS SPECTROMETER IS USED FOR THE ANALYSIS OF SOLID MATERIALS. AN ELECTRIC ARC IS TRIGGERED BETWEEN TWO SAMPLES OF AN ALLOY STEEL - THE SURFACE METAL IONIZES AND THE RESULTING SAMPLE IS PASSED INTO THE SPECTROMETER.
COLLABORATORS--BRIAN KAUFMAN AND ROY PACE
PROD-AEI 16 COLOR
DIST-AEI RE SOUND 1961

ANALYSIS OF SOLIDS WITH THE MS-7 MASS SPECTROMETER 5 MIN

THE ANALYSIS OF ALLOYS BY THE MASS SPECTROMETER PERMITS DETECTION OF IMPURITIES OF ONE PART IN ONE THOUSAND MILLION. PRINCIPLE OF OPERATION IS EXPLAINED BY ANIMATION.
PROD-AEI 16 COLOR
DIST-AEI RE SOUND 1961

ASSEMBLING THE ELECTRIC MOTOR 4 MIN

CLEAR, CLOSE-UP ILLUSTRATIONS OF STEP-BY-STEP ASSEMBLY OF KIT MOTOR, SHOWING ALL CONSTRUCTIONAL DETAILS.
PROD-GATE 8 COLOR
DIST-GATE TC TN 1966

AUDIO FREQUENCY POWER AMPLIFIER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

AUDIO FREQUENCY VOLTAGE AMPLIFIER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

AUDIO OSCILLATOR OPERATION 9 MIN

EXPLAINS OPERATIONS OF AUDIO OSCILLATORS AND DEMONSTRATES THEIR USE. PERFORMANCE OF OSCILLATOR IS SHOWN BY CHECKING AN AMPLIFIER WITH THE AUDIO OSCILLATOR AND A SCOPE.
PROD-USN 16 BW
DIST-USN RE SOUND 1945

BASIC PRINCIPLES OF POWER REACTORS 9 MIN

DESCRIBES NUCLEAR POWER REACTORS AND HOW THEY PRODUCE STEAM FOR THE GENERATION OF ELECTRICITY, FISSION, CONTROLLED CHAIN REACTION AND FUNCTIONS OF BASIC REACTOR COMPONENTS. EXCERPT FROM ''THE NEW POWER.''
PROD-LMAF 16 COLOR
DIST-LMAF RE SOUND 1962

BUOYANCY IN A GAS 2 MIN

ILLUSTRATES A CONTROLLED VACUUM ASSEMBLY IN THE LABORATORY, DEMONSTRATES QUALITATIVELY THE EFFECT OF THE BUOYANT FORCE OF AIR UPON THE WEIGHT OF A GAS VOLUME.
PROD-EBF 8 COLOR SERIES-CIC
DIST-EBF TC TN 1964

BUOYANCY IN LIQUIDS 3 MIN

USING SPECIALLY DESIGNED APPARATUS, RELATES LOSS OF WEIGHT OF THE SOLID TO VOLUME AND WEIGHT OF DISPLACED LIQUID AND DEFINES BUOYANT FORCE AS WEIGHT OF WATER DISPLACED.
PROD-EBF 8 COLOR SERIES-CIC
DIST-EBF TC TN 1964

CATHODE AND ANODE IN A VACUUM TUBE (GERMAN) 9 MIN

HEATING OF A CATHODE. TRIODE CIRCUITS. EFFECTS OF GRID POTENTIAL. SPACE CHARGE. CHARACTERISTICS OF A TRIODE. MODULATION OF ANODE CURRENT. EFFECT OF MEAN VALUE OF MODULATION. CONSTRUCTING AN OSCILLATING CIRCUIT. TRIODE AS OSCILLATOR.
PROD-FWU 16 BW
DIST-FWU RE SILENT 1943

COMBUSTION IN ENGINES 10MIN

TIME-LAPSE STUDY OF COMBUSTION UNDER CONDITIONS OF PRE-IGNITION, IGNITION, POST-IGNITION AND MULTIPLE POST-IGNITION, KNOCK, PRE-IGNITION AND KNOCK, AND PRE-IGNITION AND POST-IGNITION.
PROD-AMOCO2 16 BW
DIST-AMOCO2 RE SILENT

COMPUTER ANIMATION EXAMPLES 10MIN

EXCERPTS FROM ''A COMPUTER TECHNIQUE FOR THE PRODUCTION OF ANIMATED MOVIES,'' (KNOWLTON) - ''FORCE, MASS, AND MOTION,'' (SINDEN) AND ''SIMULATION OF A TWO GYRO-GRAVITY GRADIENT ATTITUDE CONTROL SYSTEM,'' (ZAJAC).
PROD-BTL 16 BW
DIST-BTL RE SILENT 1965

CONDENSATION NUCLEI 4 MIN

NO INFORMATION AVAILABLE.
PROD-UWF 8 COLOR SERIES-AMS
DIST-UWF TC TN 1967

CONQUEST OF LIGHT, THE 10MIN

DESCRIBES THE LASER, OR OPTICAL MASER, IN NONTECHNICAL TERMS AND ILLUSTRATES SOME OF ITS USES.
NOT AVAILABLE FOR SALE
PROD-BTL 16 COLOR
DIST-BTL RE SOUND 1964

CONSTRUCTION OF THE EXPERIMENTAL BOILING WATER REACTOR 10MIN

DESCRIBES HIGHLIGHTS OF CONSTRUCTION OF EBWR BUILDINGS, PARTICULARLY THE CONTAINMENT SHELL FOR THE POWER PLANT.
PROD-ANL 16 BW
DIST-BYRON RE SOUND 1957

CRYOGENIC PUMP 1 MIN

USE OF LIQUID HELIUM TO OBTAIN PUMPING ACTION IS SHOWN TOGETHER WITH RADIATION SHIELDING FEATURES COMMONLY INCLUDED IN THIS PUMP.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

DC DYNAMO 3 MIN

MODEL SHOWS HOW ELECTRICITY CAN BE GENERATED WITH A MAGNET AND COIL. THE CURRENT IS RECORDED ON A METER AND INTERPRETED ON A GRAPH.
PROD-WWP 8 COLOR
DIST-WWP TC TN

DC MOTOR 2 MIN

DIAGRAMMATIC EXPLANATION OF THE SIMPLE PRINCIPLES.
PROD-WWP 8 COLOR
DIST-WWP TC TN

DEMODULATOR, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

DIESEL ENGINE, THE--IDEAL DIESEL CYCLE 8 MIN

EXPLAINS THE SIX PROCESSES IN DIESEL ENGINE CYCLE. TRACES IDEAL DIESEL CYCLE ON PRESSURE-VOLUME DIAGRAM. DISCUSSES FACTORS AFFECTING EFFICIENCY.
PROD-MGHT 16 BW
DIST-MGHT RE SOUND 1952

DIFFUSION PUMP--MERCURY VAPOR 2 MIN

ANIMATED. SHOWS HOW GAS MOLECULES ARE BOMBARDED BY HEAVY MERCURY ATOMS TO OBTAIN PUMPING ACTION. THE USE OF TRAPS AND FORE PUMPS IS INCLUDED.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

DIFFUSION PUMP--OIL VAPOR 3 MIN

SPECIAL DESIGN FEATURES OF A MULTI-STAGE FRACTIONATING LOW VAPOR-PRESSURE OIL PUMP ILLUSTRATED. EXPLAINS WAY IN WHICH PRESSURES DOWN TO 10 TO THE -7 TORR ARE OBTAINED.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

E/M DEMONSTRATION 4 MIN

PROGRAMMED APPROACH COMBINING A FILM DEMONSTRATION OF THOMPSON'S E/M DETERMINATION WITH A WORKSHEET PROVIDES A STUDY OF APPARATUS, IDENTIFICATION OF SIGNIFICANT EXPERIMENTAL PARAMETERS AND SAMPLING OF PROCEDURE AND RESULTS.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1963

ELASTOHYDRODYNAMIC LUBRICATION 10MIN

TESTING THE CLASSICAL THEORY OF LUBRICATION UNDER HEAVY LOAD.
PROD-AEI 16 COLOR
DIST-AEI RE SOUND

ELECTRICAL QUALITY CONTROL OF RAW MICA USED IN CAPACITORS 5 MIN

NO INFORMATION AVAILABLE.
NOT AVAILABLE FOR SALE
COLLABORATOR--K. G. COUTLEE
PROD-BTL 16 COLOR
DIST-BTL RE SILENT 1948

ELECTRONIC BEAM TUBE

SHOWS THE MOTION OF ELECTRONS IN AN ELECTRONIC BEAM TUBE. ILLUSTRATES DEFLECTION BY AN ELECTRIC FIELD, AND THE CIRCULAR AND HELICAL MOTIONS CAUSED BY A MAGNETIC FIELD.
PROD-RMCS 8 COLOR
DIST-RMCS TC TN

ENERGY ABSORPTION PROCESS EMPLOYING FRANGIBLE METAL TUBING, THE 8 MIN

SHOWS A FRANGIBLE TUBE SHOCK ABSORBER RELYING ON THE PRINCIPLE OF FRAGMENTATION. PROVIDES HIGH ENERGY ABSORPTION AND WAS DEVELOPED FOR USE AS A LANDING IMPACT ABSORBER.
PROD-NASA 16 COLOR
DIST-NASA RE SOUND 1964

ENGINE, THE 5 MIN

SHOWS THE BASIC ACTION OF THE INTERNAL COMBUSTION ENGINE, DESCRIBING ITS CONTROL AND PRIMARY PARTS AND EXPLAINING HOW THE FUEL AND ELECTRICAL SYSTEMS INTERRELATE.
PROD-AMOCO2 8,16 BW
DIST-AMOCO2 FC 1964

FIRING THE GETTERS 4 MIN

AFTER A GLASS TUBE IS COMPLETELY SEALED OFF FROM THE VACUUM SYSTEM, GETTERS ARE FIRED IN THE PROPER SEQUENCE TO PRODUCE HIGH VACUUM. EXCERPT FROM ''SOLDER GLASS TENCHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

FORE PUMP,THE 2 MIN

ANIMATED DIAGRAMS SHOW THE CYCLE OF A FORE PUMP.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1963

FRASCH SULPHUR PUMP 4 MIN

ANIMATED. ILLUSTRATES WORKING PRINCIPLES OF THE FRASCH SULPHUR PUMP.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1963

FREQUENCY CHANGER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

FRICTION BRAKE EXPERIMENT, A 7 MIN

FRICTION BRAKE MEASURES POWER OUTPUT OF SMALL MOTOR. SPLIT BLOCK CLAMPED LOOSELY ON A WHEEL ON THE SHAFT OF MOTOR. AS WHEEL ROTATES, FRICTIONAL FORCE IT EXERTS ON BLOCK IS MEASURED AND RADIUS OF WHEEL AND NUMBER OF RPM IS CALCULATED.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

GASOLINE ENGINE,THE 8 MIN

GRAPHICALLY REPRESENTS THE SIX PROCESSES REPEATED IN GAS ENGINE CYCLE. TRACES CYCLE WHICH RESULTS WHEN FRICTION, ACCELERATION, TURBULENCE AND HEAT CONDUCTION ARE ELIMINATED ON A PRESSURE-VOLUME DIAGRAM.
PROD-MGHT 16 BW
DIST-MGHT RE SOUND 1951

HEIGHT GAUGES AND TEST INDICATORS 10MIN

READING OF THE VERNIER SCALE USED ON A HEIGHT GAUGE. SHOWS SEVERAL FORMS OF TEST INDICATORS AND DEMONSTRATES THEIR USE.
PROD-USOE 16 BW
DIST-DUART RE SOUND 1941

HOMOGENEOUS NUCLEATION AND THE DIELECTRIC NATURE OF ICE CRYSTALS 4 MIN

NO INFORMATION AVAILABLE.
PROD-UWF 8 BW SERIES-AMS
DIST-UWF TC TN 1967

HOOKE'S LAW AND YOUNG'S MODULUS 9 MIN

THE ELONGATION OF A COPPER WIRE UNDER VARIOUS LOADS IS SHOWN TO BE PROPORTIONAL TO THE FORCE APPLIED. BY ACCURATE MEASUREMENTS, YOUNG'S MODULUS FOR THIS SAMPLE OF COPPER IS DETERMINED.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1961

HOT WATER SYSTEM 2 MIN

DIAGRAMMATIC EXPLANATION OF THE DOMESTIC HOT WATER SYSTEM SHOWING CIRCULATION OF HOT WATER AND REPLACEMENT OF HOT WATER BY COLD.
PROD-WWP 8 COLOR SERIES-LAB
DIST-WWP TC TN

HYPOCYCLIC MOTION 9 MIN

KINEMATICS OF A BAR OF CONSTANT LENGTH WHOSE ENDS SLIDE ON TWO FIXED GUIDES. SHOWS BODY AND SPACE CENTRODES AND THE GENERATION OF MOTION BY ROLLING ONE ON THE OTHER. GENERATIONS OF THE ELLIPSE AS A TROCHOID ARE FOLLOWED BY A DIAGRAM OF AN ELLIPTIC CHUCK.
PROD-SET L 16 BW
DIST- RE SILENT 1938

HYDRAULIC LIFT, PART I 2 MIN

A DIAGRAMMATIC EXPLANATION OF HOW FORCE APPLIED INTO A PUMP CAN RAISE A WEIGHT.
PROD-WWP 8 COLOR
DIST-WWP TC TN

HYDRAULIC LIFT, PART II 2 MIN

A DIAGRAMMATIC EXPLANATION SHOWING RESERVOIR AND VALVES FOR REPEATED WORKING OF A PUMP.
PROD-WWP 8 COLOR
DIST-WWP TC TN

INTRODUCTION TO JET ENGINES, AN 5 MIN

ANIMATED. SHOWS HOW A JET ENGINE DEVELOPS THRUST, THROUGH SLOW MOTION.
PROD-NFBC 8 COLOR
DIST-NFBC TC TN 1958

ION PUMP 4 MIN

PERSPECTIVE DRAWINGS AND ANIMATION USED TO SHOW HOW DRY, NO-MOVING-PARTS ION PUMPING IS ACHIEVED. SPECIAL DESIGN FEATURES, INCLUDING ION DECELERATION AND TITANIUM GETTERING EXPLAINED.
PROD-YALE 16 BW SERIES-YCF
DIST-AIM RE SOUND 1964

LASER BEAM, THE 7 MIN

DEMONSTRATES A HELIUM-NEON GAS LASER EQUIPPED WITH A SMALL PIEZO-ELECTRICAL OPTICAL MODULATOR TO VARY THE INTENSITY OF LIGHT BEAM FOR COMMUNICATION. DEVICE PRODUCES 1.7 MC BANDWIDTH WITH 40 PERCENT MODULATIONS.
PROD-NAA 16 COLOR
DIST-NAA RE SOUND

LIFT PUMP, THE 4 MIN

ACTION OF A LIFT PUMP ILLUSTRATED BY AN ACTUAL PUMP, A LABORATORY MODEL, AND ANIMATED DIAGRAMS.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1963

MAKING AN ANODE STRUCTURE 4 MIN

A CYLINDRICAL ANODE IS MADE AND A SUPPORT STRUCTURE FASTENED TO IT. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 COLOR SERIES-SG
DIST-SET F TC TN 1963

MEASURING THE VERY SMALL 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 BW SERIES-CHEM
DIST-DIL TC TN 1966

MECHANICAL PUMPS--FORE PUMPS 2 MIN

USES PHOTOGRAPHS, DRAWINGS AND ANIMATION TO SHOW THE OPERATION OF AN OIL-SEALED, ECCENTRIC-VANE FORE PUMP. NEW GAS-BALLAST PRINCIPLE FOR PURIFYING THE PUMP OIL EXPLAINED.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

MECHANICAL PUMPS--MOLECULAR PUMPS 1 MIN

ANIMATED DRAWING OF THE OPERATION OF A PUMP WHICH USES FRICTIONAL FORCES BETWEEN A FAST-MOVING CYLINDER AND GAS MOLECULES TO ACHIEVE LOW PRESSURE AND FAST PUMPING SPEED.
PROD-YALE 16 COLOR SERIES-YCF
DIST-AIM RE SOUND 1964

METALS--MECHANICAL PROPERTIES 4 MIN

NO INFORMATION AVAILABLE.
PROD-NUFF 8 COLOR SERIES-CHEM
DIST-DIL TC TN 1966

MICHAEL FARADAY 9 MIN

AN APPRECIATION OF FARADAY BY WILLIAM BRAGG TO MARK THE CENTENARY OF THE DISCOVERY OF INDUCTION. REISSUED IN 1962.
PROD-BTH 16 BW
DIST-AEI RE SOUND 1931

MICROMETER (METRIC), THE 3 MIN

ILLUSTRATES THE USE OF A MICROMETER SCREW PUMP.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1963

MICROMETER (METRIC), THE PRACTICAL EXAMPLES 2 MIN

FIVE EXAMPLES OF READINGS ON A MICROMETER SCREW GAUGE.
PROD-TECH 8 COLOR
DIST-EFVA TC TN 1963

MISSILE NAMED MAC, A 8 MIN

ANIMATED. EXPLAINS THE COMMAND GUIDANCE SYSTEM DESIGNED BY BELL TELEPHONE LABORATORIES.
NOT AVAILABLE FOR SALE
PROD-BTL 16 COLOR
DIST-BTL RE SOUND 1962

NEUTRON IMAGE DETECTOR 6 MIN

DESCRIBES A NEW VACUUM TUBE WHICH CONTAINS A NEUTRON-SENSITIVE SCREEN AND PRODUCES A BRILLIANT IMAGE WHICH CAN BE VIEWED WITH A CLOSED-CIRCUIT TELEVISION.
PROD-ANL 16 COLOR
DIST-CSC RE SOUND 1965

NUCLEAR REACTOR, THE 9 MIN

EXPLAINS NUCLEAR STABILITY AND NEUTRON-INDUCED FISSION, NEUTRON EMISSION, THE SELF-SUSTAINING CHAIN REACTION, AND THE ROLE OF THE MODERATOR AND THEIR APPLICATIONS TO THE PILE.
PROD-MGHT 16 BW
DIST-MGHT RE SOUND 1954

NUCLEAR REACTOR SPACE POWER SYSTEMS 8 MIN

TECHNICAL FILM HIGHLIGHTING FABRICATION AND TESTING OF A 500-WATT THERMOELECTRIC SYSTEM, A 3,000-WATT TURBOELECTRIC SYSTEM, AND A REACTOR FOR A 35,000-WATT TURBOELECTRIC SYSTEM.
PROD-AI 16 COLOR
DIST-BYRON RE SOUND 1964

NUCLEAR SHIP SAVANNAH, THE 10MIN

ACCOUNT OF DESIGN, CONSTRUCTION AND OPERATION OF NUCLEAR POWER PLANT FOR THE NS SAVANNAH.
PROD-BWC 16 COLOR
DIST-BYRON RE SOUND 1964

NUCLEATION OF SUPERCOOLED CLOUDS 4 MIN

NO INFORMATION AVAILABLE.
PROD-UWF 8 COLOR SERIES-AMS
DIST-UWF TC TN 1967

OPERATION OF THE B. AND L. SPECTRONIC 20 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

OPERATION OF THE BECKMAN IR-8 SPECTROPHOTOMETER 4 MIN

NO INFORMATION AVAILABLE.
PROD-OUELL 8 COLOR
DIST-ACCC TC TN 1967

OPERATION OF THE VAPOR CHROMATOGRAPH 4 MIN

NO INFORMATION AVAILABLE.
PROD- 8 COLOR
DIST-ACCC TC TN 1967

OPTICAL COMMUNICATIONS DEVICE 6 MIN

EXPLAINS DEVICE BASED ON CORNER REFLECTOR, ONE SIDE OF WHICH IS REPLACED WITH MYLAR FILM WHICH CAN MODULATE A LIGHT BEAM EMITTED BY A POWER SOURCE.
PROD-JPL 16 COLOR
DIST-JPL RE SOUND

OSCILLATOR, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

OSCILLOSCOPE, THE--WHAT IT IS, WHAT IT DOES 8 MIN

NON-TECHNICAL EXPLANATION OF THE OSCILLOSCOPE AND ITS USE STRESSING ITS IMPORTANCE AS A BASIC MEASURING TOOL.
PROD-TEK 16 COLOR
DIST-TEK RE SOUND 1961

OUR SUN IN ACTION I--PROMINENCE MOVIES IN HYDROGEN LIGHT 9 MIN

SEQUENCES OF SOLAR PROMINENCES IN THE LIGHT OF HYDROGEN (6563 ANGSTROM, H-ALPHA LINE).
NOT AVAILABLE FOR SALE
PROD-SPO 16 BW
DIST-SPO RE SILENT 1967

OUR SUN IN ACTION II--SOLAR CORONA 9 MIN

FILM OF THE SOLAR CHROMOSPHERE SHOWING FLARES AND FILAMENTS.
NOT AVAILABLE FOR SALE.
PROD-SPO 16 BW
DIST-SPO RE SILENT 1967

OUR SUN IN ACTION III--LARGE SCALE PROMINENCE MOVIES 9 MIN

FILMS OF LARGE SCALE PROMINENCE PHENOMENA.
NOT AVAILABLE FOR SALE.
PROD-SPO 16 BW
DIST-SPO RE SILENT 1967

PHOTO-ELECTRIC CELLS 4 MIN

THREE PHOTO-ELECTRIC CELLS--PHOTO-EMISSION GAS-FILLED CELL, BARRIER-LAYER CELL, SELENIUM CELL--ARE DESCRIBED AND THEIR PROPERTIES OUTLINED.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

PHYSICS FOR ALL 5 MIN

SERIES OF 8MM CARTRIDGES COVERING A VARIETY OF TOPICS IN PHYSICS.

A. EXPANSION OF METAL BY HEAT AND ELECTRICAL ENERGY, OF WATER AND OF GASES. DENSITY OF SOLIDS AND LIQUIDS.
B. FLOTATION. SURFACE EFFECTS - COMPRESSION OF SOLIDS, LIQUIDS AND GASES - AIR PRESSURE.
C. MICRO PICTURE OF MATTER THROUGH SIMULATION OF MOLECULAR VIBRATION BY LIGHT BALLS IN A GLASS TUBE. CRYSTALS AND CRYSTAL STRUCTURE - MOLECULAR SIZE.
D. KINETIC MODELS - RADIOACTIVITY - CLOUD TRACKS - TEMPERATURE AND KINETIC ENERGY OF MOLECULES.
E. EFFECT OF FORCE ON SHAPE - EFFECT ON MOTION - CONTACT FORCES - GRAVITY - MAGNETIC FORCE - ELECTRIC FORCE.
F. ACTION-REACTION--FORCES IN PAIRS - INERTIA - CENTER OF GRAVITY - EQUILIBRIUM.
G. MACHINES - POTENTIAL AND KINEITC ENERGY ILLUSTRATED BY A PENDULUM, FLYWHEEL AND SPRING, RING MAGNETS, ETC. - ENERGY TRANSFORMERS.

PROD-EFS 8 COLOR
DIST-EFS TC TN

POWER SUPPLY UNIT, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

PRECISION COMMAND GUIDANCE FOR BALLISTIC MISSILES 6 MIN

SHOWS HOW GUIDANCE SYSTEMS MADE POSSIBLE THE FIRST RECOVERY OF A THOR-ABLE MISSILE NOSE CONE.
NOT AVAILABLE FOR SALE
PROD-WEC 16 BW
DIST-BTL RE SOUND 1959

PREPARING AND BAKING A SOLDER GLASS SEAL 5 MIN

SHOWS THE TECHNIQUES OF APPLYING SOLDER GLASS PASTE, JOINING TUBE AND HEADER AND BAKING THE JOINT. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

PREPARING A DIODE HEADER 4 MIN

TECHNIQUES OF PREPARING AND MOUNTING DIODE ELEMENTS ON A STANDARD GLASS VACUUM TUBE HEADER. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

PREPARING THE GETTER HEADER 5 MIN

TECHNIQUES OF PREPARING AND MOUNTING GETTERS ON A STANDARD GLASS VACUUM TUBE HEADER. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

PRESSURE 3--SUCTION CUP 2 MIN

SHOWS THE LOAD WHICH CAN BE SUPPORTED BY A SUCTION CUP PRESSED TO THE UNDERSIDE OF A PIECE OF FLATE GLASS. SHOWS METHOD USED TO CALCULATE APPROXIMATE VALUE OF ATMOSPHERIC PRESSURE.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

PRESSURE 4--COLLAPSING CAN 2 MIN

A METAL CAN IS SHOWN TO COLLAPSE WHEN THE AIR IS REMOVED. ANIMATED DIAGRAMS ILLUSTRATE DETAILS.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

PRESSURE 5--MAGDEBURG HEMISPHERES 2 MIN

SHOWS LARGE FORCE NEEDED TO SEPARATE A PAIR OF EVACUATED HEMISPHERES WITH ACCURATELY MADE SURFACES. METHOD TO CALCULATE APPROXIMATE VALUE FOR THE PRESSURE OF ATMOSPHERE SHOWN.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

PROJECT DUGOUT 9 MIN

REPORT ON A CHEMICAL HIGH EXPLOSIVE EXPERIMENT INVOLVING THE SIMULTANEOUS DETONATION OF FIVE 20-TON CHARGES OF NITROMETHANE UNDERGROUND.
PROD-LRL 16 COLOR
DIST-PALMER RE SOUND 1964

PROJECT SEDAN 8 MIN

REPORT ON NUCLEAR CRATERING DETONATION TO DETERMINE THE CRATERING OF RADIOACTIVITY ENTRAPMENT EFFECTS OF DETONATING A 100-KILOTON NUCLEAR DEVICE UNDERGROUND. DISCUSSES RELATION OF DEPTH OF EXPLOSION AND CRATER SIZE AND DEPTH AND CONTAINMENT OF RADIOACTIVITY.
PROD-LRL 16 COLOR
DIST-PALMER RE SOUND 1962

PROPANE BUBBLE CHAMBERS 10MIN

CHRONICLES THE CONSTRUCTION AND FIELD OF OPERATION OF THE LARGE (200 LITER) PROPANE CHAMBER. (JOINT INSTITUTE FOR NUCLEAR RESEARCH IN THE USSR)
PROD- 16 BW
DIST-IAEA RE SOUND 1964

PUNCHED CARDS, TRUTH TABLES AND SWITCHES 4 MIN

AN INTRODUCTION AND COMPARISON OF THESE DEVICES.
PROD-GATE 8 BW SERIES-AT
DIST-GATE TC TN 1967

RADAR 4 MIN

A MODEL OF A RADAR SCANNER AND SCREEN IS SHOWN WITH A MODEL AIRCRAFT ''FLYING'' OVER THEM. THE OPERATION OF THE SCANNING MECHANISM IS ANALYZED USING A CATHODE-RAY OSCILLOSCOPE AND ANIMATION. PROGRAM NOTES AVAILABLE FROM BBC.
PROD-GATE 8 BW SERIES-EBC
DIST-ICF TC TN 1966

RECEIVER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-EE
DIST-FAC TC TN 1967

REPULSION MOTOR PRINCIPLES 10MIN

DESCRIBES THE REPULSION-TYPE MOTOR AND ITS USES.
PROD-USOE 16 BW
DIST-USOE RE SOUND 1945

SCIENTIFIC METHOD IN ACTION 15MIN

THE FALLING OBJECT EXPERIMENTS OF GALILEO SERVE AS INTRODUCTION TO SCIENTIFIC METHOD - ACTUAL MOVIES OF POLIO EXPERIMENTS BY SALK SHOW APPLICATION OF SCIENTIFIC METHOD TO A COMPLEX PROBLEM.
PROD-VEF 8 COLOR
DIST-IFB FC TN

SEALING-OFF THE SMALL HEADER TUBES 4 MIN

THE VACUUM TUBE IS PREPARED FOR SEALING UNDER VACUUM. THE ACTUAL SEAL-OFF IN AN ELECTRIC OVEN IS SHOWN. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

SETTING UP THE BALANCE 3 MIN

ADJUSTMENTS NECESSARY TO PREPARE A BALANCE FOR USE ARE SHOWN ONE BY ONE IN CLOSE-UPS.
PROD-GATE 8 COLOR
DIST-GATE TC TN

SIGNAL GENERATOR OPERATION 10MIN

SHOWS HOW TO USE A SIGNAL GENERATOR TO ALIGN A RADIO RECEIVER.
PROD-USN 16 BW SERIES-RTT
DIST-USN RE SOUND 1949

SMALL TURBINES WITH AIR BEARINGS (FRENCH) 9 MIN

DESCRIPTION OF OPERATION AND CHARACTERISTICS OF A SMALL AIR TURBINE RUNNING ON A VERY THIN AIR FILM AND ROTATING AT SEVERAL THOUSAND REVOLUTIONS PER SECOND.
PROD-NORI 16 COLOR
DIST-FRCH RE SOUND 1966

SNAP-8--SYSTEM FOR NUCLEAR AUXILIARY POWER 10MIN

SHOWS PRINCIPAL COMPONENTS AND ILLUSTRATES AND EXPLAINS OPERATION OF SYSTEM.
PROD-AEC 16 COLOR
DIST-AEC RE SOUND 1966

SOLAR CHROMOSPHERE, THE 7 MIN

SHOWS SOLAR CORONA FEATURES AT [illegible] LINES. NOT AVAILABLE FOR SALE.
PROD-[illegible] 16 BW
DIST-[illegible] RE SOUND 1967

SOLDER GLASS TECHNIQUE 20MIN

TECHNIQUE USED TO PRODUCE INEXPENSIVE HIGH VACUUM APPARATUS. SHOWS CONSTRUCTION OF THE ELECTRODE STRUCTURE, THE PROCESS OF SEALING THE APPARATUS AND TESTING FOR LEAKS.
COLLABORATORS--JOHN G. KING AND JAN ORSULA
PROD-EDC 8 COLOR SERIES-CPF
DIST-EDC FC TN 1963

STROBE PHOTOS

NO INFORMATION AVAILABLE.
PROD-ECTHEN 8 COLOR
DIST- TC TN 1967

SYPHON, THE 4 MIN

SIMPLE LAB DEMONSTRATION OF A SYPHON. ARROWS SHOW THE FORCES DUE TO AIR PRESSURE ON THE SURFACES OF THE LIQUID AND FORCES ACTING ON LIQUID ON HIGHEST POINT OF TUBE.
PROD-EFVA 8 COLOR
DIST-EFVA TC TN 1963

TELEVISION RECEIVERS 7 MIN

BLOCK DIAGRAM BUILDS UP A RECEIVER CIRCUIT FROM ANTENNA AND TRANSMISSION LINE TO PICTURE TUBE.
PROD-MGHT 16 BW
DIST-MGHT RE SOUND 1953

TESTING FOR LEAKS AND OUTGASSING 4 MIN

VISUAL PRESENTATION OF AN ELECTRICAL DISCHARGE (TESLA COIL) IN A GOOD AND A POOR VACUUM. THE TECHNIQUE OF OUTGASSING THE ELEMENTS BY HEATING IS SHOWN. EXCERPT FROM ''SOLDER GLASS TECHNIQUES.''
PROD-EDC 8 BW SERIES-SG
DIST-SET F TC TN 1967

TIME REVERSAL 8 MIN

SHOWS A DROP OF DYE IN GLYCERINE, STIRRED IN AND THEN UNSTIRRED SO THAT IT BECOMES A DROP AGAIN.
COLLABORATOR--R. G. SHULMAN
PROD-BTL 8,16 COLOR
DIST-BTL FC,RE TN

TOMORROW'S POWER--TODAY 6 MIN

NONTECHNICAL FILM EXPLAINING PRINCIPLE OF ATOMIC POWER PRODUCTION.
PROD-ANL 16 COLOR
DIST-COLBRN RE SOUND 1964

TRANSFORMER, THE 4 MIN

SHOWS DIAGRAMS OF A PERFECTLY EFFICIENT STEP-UP AND STEP-DOWN TRANSFORMER AND DEMONSTRATES HOW A STEP-DOWN TRANSFORMER MAY BE USED TO PRODUCE A LARGE CURRENT. SHOWS MODE OF ACTION OF AN EDDY CURRENT FURNACE.
PROD-EOTHEN 8 COLOR SERIES-ELEC
DIST-FAC TC TN 1966

TRANSISTOR, THE 10MIN

TRACES THE HISTORY OF THE ''AUDION.'' PICTURES AND DISCUSSES GERMANIUM EXPERIMENTS LEADING TO DEVELOPMENT OF THE TRANSISTOR. DISCUSSES THE ADVANTAGES OF THE TRANSISTOR OVER THE VACUUM TUBE.
NOT AVAILABLE FOR SALE
PROD-BTL 16 BW
DIST-BTL RE SOUND 1953

TRANSMITTER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

TUNED AMPLIFIER, THE 4 MIN

NO INFORMATION AVAILABLE
PROD-MAC 8 COLOR SERIES-BE
DIST-FAC TC TN 1967

TWO PARADOXES 2 MIN

COMPUTER-ANIMATED. SHOWS A BALL THAT BOUNCES UP A STAIRCASE AND RETURNS ON ITSELF AND SO ''NEVER GETS ANY HIGHER'' WHILE PLAYING A MUSICAL ''CHORD'' THAT KEEPS RISING, BUT ALSO ''NEVER GETS ANY HIGHER.'' THE ''CHORD'' IS A GROUP OF NOTES WHOSE INTENSITY-FREQUENCY ENVELOPE REMAINS THE SAME.
COLLABORATORS--R. N. SHEPARD AND E. E. ZAJAC
NOT AVAILABLE FOR SALE
PROD-BTL 16 BW
DIST-BTL RE SOUND

USE OF WESTMINSTER ELECTROMAGNETIC KIT

NO INFORMATION AVAILABLE.
PROD-ECTHEN 8 COLOR
DIST- TC TN 1967

USING THE BALANCE 4 MIN

SHOWS COMPLETE SEQUENCE OF WEIGHING AN OBJECT USING CLOSE-UPS TO ALLOW TEACHER TO EXPLAIN DETAIL NOT VISIBLE TO CLASS.
PROD-GATE 8 COLOR
DIST-GATE TC TN

VACUUM DISTILLATION 6 MIN

THE SEPARATION OF HIGH BOILING POINT PRODUCTS. THE PROCESS IS DEMONSTRATED BY A SECTIONAL WORKING MODEL OF THE VACUUM DISTILLATION COLUMN.
PROD-MULTI 16 BW
DIST-SHELL RE SOUND 1954

VALLECITOS BOILING WATER REACTOR 8 MIN

SHOWS OPERATION INCLUDING VIEWS OF LOADING OF REACTOR INTERIOR OF REACTOR CONTAINMENT VESSEL, AND TURBINE-GENERATOR INSTALLATION.
PROD-GE 16 COLOR
DIST-BYRON RE SOUND 1958

VAN DE GRAAFF GENERATOR, THE 4 MIN

EXAMINES THE CONSTRUCTION AND OPERATION OF A SMALL VAN DE GRAAFF GENERATOR. BEGINS WITH AN ILLUSTRATION OF THE LARGE ARC WHICH CAN BE DRAWN FROM THE UPPER TERMINAL OF THE GENERATOR AND EXPLAINS FUNCTIONS OF THE VARIOUS PARTS OF THE GENERATOR.
COLLABORATOR--A. E. WALTERS
PROD-EFL 8,8S COLOR SERIES-ELST
DIST-EFL TC TN 1966

VERNIER AND MICROMETER SCALES 9 MIN

PRINCIPLES EXPLAINED - INSTRUCTIONS FOR READING SCALES GIVEN.
PROD-PURDUE 16 BW
DIST-PURDUE RE SOUND 1960

VERNIER EXAMPLES 2 MIN

GIVES FIVE EXAMPLES OF VERNIER READINGS SHOWING THE SCALE OF ACTUAL VERNIER CALIPERS. CAN BE USED AS TEST FOR STUDENTS.
PROD-GATE 8 COLOR
DIST-GATE TC TN

2

NIER SCALE, THE 3 MIN

SHOWS VERNIER CALIPERS BEING USED TO MEASURE AN OBJECT. ANIMATED DIAGRAM SHOWS HOW VERNIER SCALE WORKS AND THE MANNER IN WHICH ONE SET OF DIVISIONS IS READ AGAINST THE OTHER.

PROD-GATE 8 COLOR
DIST-GATE TC TN

RATION OF THE RAIL JOINT (CZECHOSLOVAKIAN) 8 MIN

FILM AS RESEARCH METHOD FOR SOLVING SCIENTIFIC PROBLEM PART 1 SHOWS PURPOSE AND METHOD OF USING FILM - PART 2 PRESENTS RESULTS.

PROD- 16 BW
DIST- RE SOUND 1963

GHING PROCEDURE 4 MIN

ILLUSTRATES THREE TYPES OF BALANCES--THE PLATFORM BALANCE, TRIPLE BEAM (CENTIGRAM) BALANCE, AND THE ANALYTICAL BALANCE. DEFINES A CORRECT PROCEDURE FOR WEIGHING, USING A TRIPLE BEAM BALANCE ACCURATE TO 1/100TH OF A GRAM.

PROD-EBF 8 COLOR
DIST-EBF TC TN

WEIGHING--TRIPLE BEAM BALANCE 4 MIN

DEMONSTRATES PROPER PROCEDURE FOR HANDLING AND WEIGHING, SHOWING ACTUAL WEIGHING FOR A SAMPLE.

PROD-EBF 8 COLOR
DIST-EBF TC TN

WINDING AN ELECTRIC MOTOR 9 MIN

EXPLAINS THE WORKING AND WINDING OF A NORMAL THREE-PHASE MOTOR, FIRST BY ANIMATION AND THEN BY SHOWING WINDING AND CONNECTIONS FOR A STANDARD COMMERCIAL THREE-PHASE INDUCTION MOTOR.

PROD-BML 16 COLOR
DIST-BML RE SOUND 1960

ZERO POWER REACTOR III 10MIN

ILLUSTRATES OPERATING METHODS TO STUDY FUEL CONFIGURATIONS AND THEIR EFFECT ON CRITICAL ASSEMBLY.

PROD-ANL 16 COLOR
DIST-BYRON RE SOUND 1958

Appendices

Appendix I

Distributors and Producers

AMS AMERICAN METEOROLOGICAL SOCIETY PHYSICS SERIES

TITLE	PAGE
CONDENSATION NUCLEI	53
HOMOGENEOUS NUCLEATION AND THE DIELECTRIC NATURE OF ICE CRYSTALS	55
NUCLEATION OF SUPERCOOLED CLOUDS	56

PROD-UWF DIST-UWF

AS ADVANCED SCIENCE SERIES

TITLE	PAGE
PRINCIPLES OF NUCLEAR FISSION	32

PROD-EFVA DIST-EFVA

BBC BBC SCHOOL TELEVISION LOOPS SERIES

A SERIES OF EXPERIMENTS EXCERPTED FROM MIDDLE SCHOOL PHYSICS SERIES PROGRAMS, TELEVISED BY THE BBC. PROGRAM NOTES FOR THE ORIGINAL BROADCASTS ARE AVAILABLE FROM THE BBC.

TITLE	PAGE
FALLING BODIES	6
FIELD OF VIEW	24
FOUR TELESCOPE ARRANGEMENTS	24
GAS THERMOMETER, THE	16
INTERFERENCE	24
INVERSION OF IMAGE IN BULL'S EYE	25
LONGITUDINAL NATURE OF SOUND WAVES	25
LONGITUDINAL WAVES	25
MEASURING THE SPEED OF LIGHT	25
MICROWAVES	25
MODELS OF REFLECTION AND REFRACTION	25
RADAR	57
STROBOSCOPIC PHOTOGRAPHY AS A MEANS OF MEASURING SPEED	12
TELEPHOTO LENS, THE	28
TRANSVERSE WAVES	28
200-INCH TELESCOPE AT MOUNT PALOMAR, THE	42
WAVE EQUATION, A	28
WAVE MACHINE, A	28

PROD-GATE DIST-FAC

BE BASIC ELECTRONICS

A SERIES OF FILMS PRODUCED UNDER THE SUPERVISION OF JAMES B. HELDER.

TITLE	PAGE
ACTIVE ELEMENT, THE	53
AMPLITUDE MODULATOR, THE	53
AUDIO FREQUENCY POWER AMPLIFIER, THE	53
AUDIO FREQUENCY VOLTAGE AMPLIFIER, THE	53
DEMODULATOR, THE	54
FREQUENCY CHANGER, THE	54
OSCILLATOR, THE	56
POWER SUPPLY UNIT, THE	57
RECEIVER, THE	57
TRANSMITTER, THE	58
TUNED AMPLIFIER, THE	58

PROD-MAC DIST-FAC

BP BEHAVIOR OF PENDULA SERIES

A SERIES OF FILMS DEVELOPED AT THE SUMMER CONFERENCE ON NEW INSTRUCTIONAL MATERIALS IN PHYSICS (SEATTLE, 1965) AND SHOT AT SUNY-STONY BROOK. TITLES ARE TENTATIVE.

COLLABORATORS--ALAN HOLDEN AND JUDITH BREGMAN

TITLE	PAGE
PENDULA--FORCED DAMPED HARMONIC OSCILLATORS	10
RING OF COUPLED PENDULA I--NORMAL MODES	11
RING OF COUPLED PENDULA II--MIXTURES OF NORMAL MODES	11
SAND PENDULUM I--POINT SUSPENSION	11
SAND PENDULUM II--SADDLE SUSPENSION	11
SAND PENDULUM III--SHORT SADDLE SUSPENSION	11
SAND PENDULUM IV--MULTIPLE SADDLE SUSPENSION	11

PROD-EDC DIST-SET F

CHEM NUFFIELD CHEMISTRY FILM LOOPS SERIES

A SERIES OF FILMS DESIGNED BY THE NUFFIELD FOUNDATION SCIENCE TEACHING PROJECT IN CHEMISTRY ATTEMPTING TO RELATE CHEMISTRY AT THE HIGH SCHOOL LEVEL MORE CLOSELY TO THE STUDENT'S EXPERIENCE.

TITLE	PAGE
GRAM-ATOMS	44
GROWTH OF CRYSTALS	30
HEATING WATER	16
LEAD BROMIDE ELECTROLYSIS	45
LIQUID/GAS EQUILIBRIUM	45
MEASURING THE VERY SMALL	55
METALS--MECHANICAL PROPERTIES	55
MOVEMENT OF MOLECULES	45
PLASTICS	46
RADIOACTIVE MATERIALS	32
SOLID/LIQUID EQUILIBRIUM	46
SULPHUR CRYSTALS	47

PROD-NUFF DIST-DIL

CIC CONCEPTS IN CHEMISTRY SERIES

TITLE	PAGE
BUOYANCY IN A GAS	53
BUOYANCY IN LIQUIDS	53
DENSITY	43
PHASE CHANGE	17
VOLUME	47

PROD-EBF DIST-EBF

CO COUPLED OSCILLATORS SERIES

THREE FILMS DEMONSTRATE THE FREQUENCY MODES OF A VARIETY OF COUPLED OSCILLATORS ALLOWING STUDENTS TO OBSERVE THE NATURE OF ENERGY TRANSFER BETWEEN OSCILLATING BODIES.

COLLABORATOR--ALAN HOLDEN

TITLE	PAGE
ENERGY TRANSFER	6
NORMAL MODES	10
OTHER OSCILLATORS	10

PROD-EDC DIST-SET F

CPF COLLEGE PHYSICS FILMS SERIES

A SERIES OF SHORT FILMED DEMONSTRATIONS FOR HIGH SCHOOL AND COLLEGE PHYSICS COURSES.

TITLE	PAGE
ANGULAR MOMENTUM--A VECTOR QUANTITY	5
INTERFERENCE AND DIFFRACTION--RIPPLE TANK WAVE PHENOMENA II	24
MOMENTUM OF ELECTRONS	9
SOLDER GLASS TECHNIQUE	58
TIME DILATION--AN EXPERIMENT WITH MU-MESONS	12
ULTIMATE SPEED, THE--AN EXPLORATION WITH HIGH ENERGY ELECTRONS	33

PROD-EDC DIST-SET B

DP DEMONSTRATIONS IN PHYSICS SERIES

A SERIES OF FILMS ON CRUCIAL PHENOMENA SOME OF WHICH OTHERWISE COULD NOT BE MADE AVAILABLE TO STUDENTS.

TITLE	PAGE
ABSORPTION SPECTRA	29
COUPLED OSCILLATORS--EQUAL MASSES	6
COUPLED OSCILLATORS--UNEQUAL MASSES	6
CRITICAL TEMPERATURE	15
DIFFRACTION--DOUBLE SLIT	24
DIFFRACTION--SINGLE SLIT	24
FERROMAGNETIC DOMAIN WALL MOTION	30
INERTIAL FORCES--CENTRIPETAL ACCELERATION	8
INERTIAL FORCES--TRANSLATIONAL ACCELERATION	8
MEASUREMENT OF G--CAVENDISH EXPERIMENT	8
MICHELSON INTERFEROMETER	25
NONRECURRENT WAVEFRONTS	26
PARAMAGNETISM OF LIQUID OXYGEN	31
RADIOACTIVE DECAY	32
RESOLVING POWER	27
SCINTILLATION SPECTROMETRY	33
TACOMA NARROWS BRIDGE COLLAPSE	12
TEMPERATURE WAVES	17
WILBERFORCE PENDULUM, THE	13

PROD-MILLER DIST-EFL

EC ENCYCLOPAEDIA CINEMATOGRAPHICA

ENCYCLOPAEDIA CINEMATOGRAPHICA IS AN ATTEMPT TO DEVELOP A COMPREHENSIVE COLLECTION OF SHORT, SINGLE CONCEPT FILMS IN SCIENCE AND RELATED AREAS WHICH SPEAK SPECIFICALLY TO THE SCIENTIST OR THE STUDENT OF SCIENCE AND WHICH USE FILM AS A MEANS OF DOCUMENTATION OR AS A PART OF RESEARCH. COMPOSED OF MORE THAN 1,000 SHORT FILMS, THE ENCYCLOPAEDIA COVERS PHENOMENA WHICH MEET ONE OF THE FOLLOWING CRITERIA--

1. THEY CANNOT BE OBSERVED WITH THE UNAIDED EYE
2. THEY COVER CONCEPTS FOR WHICH MEMORY ALONE OR VERBAL DESCRIPTION WILL NOT SUFFICE.
3. THEY ARE IMPORTANT EITHER BECAUSE THEY OCCUR ONLY ONCE OR BECAUSE IT IS PROBABLE THAT AT SOME TIME IN THE FUTURE THEY WILL NO LONGER BE AVAILABLE FOR SCIENTIFIC EVALUATION.

THE ENCYCLOPAEDIA'S COLLECTION OF PHYSICS FILMS (AS OPPOSED TO FILMS ON TECHNOLOGY) IS SO FAR MINIMAL. ENTRIES ARE SOLICITED FROM ALL SCIENTISTS AND ARE JUDGED BY AN EDITORIAL BOARD BEFORE ACCEPTANCE.

TITLE	PAGE
TRANSITION FROM LAMINAR TO TURBULENT FLOW	40

PROD-IWF DIST-IWF

EE ELECTRON EMISSION SERIES

COLLABORATOR--ANTHONY FRENCH

TITLE	PAGE
FIELD EMISSION OF ELECTRONS	30
PHOTO EMISSION OF ELECTRONS	32
THERMIONIC EMISSION OF ELECTRONS	22

PROD-EDC DIST-SET B

ELEC ELECTRICITY SERIES

TITLE	PAGE
CHARGES IN MOTION--THE FLOW OF CHARGE	19
CHARGES IN MOTION--THE INDUCTION PROCESS	19
ELECTROMAGNETIC INDUCTION	20
MOTOR EFFECT, THE	21
MUTUAL INDUCTION	21
PARALLEL WIRE CURRENT BALANCE, A	21
PHOTO-ELECTRIC CELLS	56
PHOTO-ELECTRICITY	32
PRIMARY CELL, THE	46
SECONDARY CELL, THE	46
TRANSFORMER, THE	58

PROD-EOTHEN DIST-FAC

ELST ELECTROSTATICS SERIES

COLLABORATOR--A. E. WALTERS

TITLE	PAGE
CAPACITORS AND DIELECTRICS	19
CHARGE DISTRIBUTION--CONCENTRATION AND POINT DISCHARGE	19
CHARGE DISTRIBUTION--THE FARADAY ICE PAIL EXPERIMENT	19
ELECTROSCOPE, THE	20
ELECTROSTATIC INDUCTION	20
INSULATORS AND CONDUCTORS	21
INTRODUCTION TO ELECTROSTATICS	21
PHOTOELECTRIC EFFECT, THE	21
PROBLEMS IN ELECTROSTATICS	21
VAN DE GRAAFF GENERATOR, THE	59

PROD-EFL DIST-EFL

ENP ELEMENTARY NUCLEAR PHYSICS SERIES

TITLE	PAGE
U-238 RADIOACTIVE SERIES	33

PROD-MGHT DIST-MGHT

ES EARTH SCIENCE SERIES

TITLE	PAGE
EARTH'S SHAPE	41

PROD-FAC DIST-FAC

HEAT HEAT SERIES

FILMED EXPERIMENTS DEMONSTRATE BASIC PHYSICAL PRINCIPLES AND APPARATUS. TREATMENTS ARE QUANTITATIVE - STUDENTS CAN TAKE READINGS FROM FILMS.

TITLE	PAGE
CONVECTION OF WATER, THE	15
CRITICAL TEMPERATURE OF SULFUR DIOXIDE, THE	15
DETERMINATION OF VAPOR PRESSURE BY BAROMETER	15
EMISSION AND ABSORPTION OF RADIATION, THE	16
HEAT DISTRIBUTION IN THE SPECTRUM OF A CARBON ARC	16
MECHANICAL EQUIVALENT OF HEAT, THE	17
REFLECTION OF RADIATION, THE	17
REGELATION	17
VAPOR PRESSURE AND BOILING	18
VAPOR PRESSURE AND TEMPERATURE	18

PROD-EOTHEN DIST-FAC

IP AN INTRODUCTION TO PHYSICS SERIES

A SERIES OF FILMS DESIGNED TO ACCOMPANY THE PROJECT PHYSICS COURSE FOR HIGH SCHOOLS AND JUNIOR COLLEGES AND PRODUCED UNDER THE TECHNICAL SUPERIVISION OF JACQUES PARENT OF THE NATIONAL FILM BOARD OF CANADA. PROJECT PHYSICS IS CO-DIRECTED BY GERALD HOLTON, JAMES RUTHERFORD, AND FLETCHER WATSON. THE SERIES INCLUDES BOTH QUALITATIVE AND QUANTITATIVE FILMS, THE LATTER OFTEN ALLOWING STUDENTS TO TAKE DATA DIRECTLY FROM THE FILM. SOME FILMS ARE ACCOMPANIED BY STROBOSCOPIC PHOTOGRAPHS OF THE EXPERIMENTS, OTHERS BY DATA SHEETS. THE SERIES IS DIVIDED INTO FIVE SUBSECTIONS. TITLES ARE TENTATIVE.

IP-AN ATOMIC AND NUCLEAR PHYSICS

SUBDIVISION OF SERIES IP, DESCRIBED ABOVE.

TITLE	PAGE
HALF-LIFE OF A RADIOACTIVE COIN	30
RUTHERFORD SCATTERING	32

IP-M CONCEPTS OF MOTION

SUBDIVISION OF SERIES IP, DESCRIBED ABOVE.

TITLE	PAGE
ACCELERATION DUE TO GRAVITY--METHOD I	5
FREE FALL FROM AN AIRCRAFT	7
GALILEAN RELATIVITY I	7
GALILEAN RELATIVITY II	7
HIGH HURDLE I	8
HIGH HURDLE II	8
MATTER OF RELATIVE MOTION, A	8
VECTOR ADDITION I	12
VECTOR ADDITION II	12

IP-E ENERGY

SUBDIVISION OF SERIES IP, DESCRIBED ABOVE.

TITLE	PAGE
ACCELERATION DUE TO GRAVITY--METHOD II	5
COLLIDING FREIGHT CARS	5
COLLISIONS WITH AN UNKNOWN OBJECT	5
ENERGY CONVERSION I--POLE VAULTER	6
ENERGY CONVERSION II--AIRCRAFT TAKE OFF	6
EXPLOSION OF A CLUSTER OF OBJECTS	6
FINDING THE SPEED OF A RIFLE BULLET--METHOD I	6
FINDING THE SPEED OF A RIFLE BULLET--METHOD II	7
FURTHER EXAMPLES OF ONE-DIMENSIONAL COLLISIONS	7
FURTHER EXAMPLES OF TWO-DIMENSIONAL COLLISIONS	7
GRAVITATIONAL POTENTIAL ENERGY	7
KINETIC ENERGY OF MOTION	8
ONE-DIMENSIONAL COLLISIONS	10
PERFECTLY INELASTIC ONE-DIMENSIONAL COLLISIONS	10
PERFECTLY INELASTIC TWO-DIMENSIONAL COLLISIONS	10
RECOIL	11
SCATTERING OF A CLUSTER OF OBJECTS	11
TWO-DIMENSIONAL COLLISIONS	12

IP-H MOTION IN THE HEAVENS

SUBDIVISION OF SERIES IP, DESCRIBED ABOVE.

TITLE	PAGE
ADVANCE OF PERIHELION	41
COMPUTER I	41
COMPUTER II--PROGRAM ORBIT	41
KEPLER'S LAW	42
ORBIT OF JUPITER SATELLITE	42
RETROGRADE MOTION OF A PLANET--CURRENT MODEL	42
RETROGRADE MOTION OF A PLANET--PTOLEMAIC MODEL	42

IP-W WAVES

SUBDIVISION OF SERIES IP, DESCRIBED ABOVE.

TITLE	PAGE
SUPERPOSITION	27
VIBRATIONS OF A DRUM	28
VIBRATIONS OF A METAL PLATE	28
VIBRATIONS OF A RUBBER HOSE	28

PROD-NFBC DIST-EBF

KINE KINEMATICS SERIES

TITLE	PAGE
AVERAGE SPEED	5
CONCEPT OF SPEED I, THE	5
CONCEPT OF SPEED II, THE	5
FREE FALL	7
INSTANTANEOUS SPEED I	8
INSTANTANEOUS SPEED II	8
INSTANTANEOUS SPEED III	8
LINEAR UNIFORM MOTION	8
MEASUREMENT OF TIME I	9
MEASUREMENT OF TIME II	9
MEASUREMENT OF TIME III, THE	9
TYPES OF MOTION	12
UNIFORMLY ACCELERATED MOTION	12

PROD-NFBC DIST-EBF

KT KINETIC THOERY ON AN AIR TABLE SERIES

SMALL PARTICLES, IN THE FORM OF PUCKS, FLOAT OVER AN AIR TABLE ON A THIN CUSHION OF AIR SO THAT THEIR MOTION IS ESSENTIALLY FRICTIONLESS. KINETIC THEORY IS STUDIED BY AGITATING THE SPRING BUMPER WALLS TO MAKE THEM ''HOT'' AND TO ACHIEVE STEADY STATE, ''MOLECULAR MOTION'' OF A COLLECTION OF PUCKS. BY USING SUPERIMPOSED ANIMATION, TRAILS LEFT BY THE PUCKS CAN BE SEEN LONG ENOUGH FOR STUDENTS TO VERIFY THE MEASUREMENTS.

TITLE	PAGE
DIFFUSION	15
EQUIPARTITION OF ENERGY	16
GRAVITATIONAL SEPARATION	16
MAXWELL SPEED DISTRIBUTION	16
PROPERTIES OF GAS	17
RANDOM WALK AND BROWNIAN MOTION	17

PROD-EFL DIST-EFL

LAT LINEAR AIR TRACK SERIES

A SERIES OF FILMS OF FRICTIONLESS GLIDERS RIDING ON AN AIR TRACK, A SPECIALLY DESIGNED METAL GIRDER ALONG WHICH GLIDERS MOVE ON A THIN CUSHION OF AIR, ALLOWS ACCURATE QUANTITATIVE STUDY OF NEWTONIAN MECHANICS. COLLABORATOR--JOHN L. STULL

TITLE	PAGE
CENTER-OF-MASS PENDULUM	5
CONSERVATION OF ENERGY	5
CONSERVATION OF MOMENTUM--ELASTIC COLLISIONS	5
CONSERVATION OF MOMENTUM--INELASTIC COLLISIONS	6
CONSTANT VELOCITY AND UNIFORM ACCELERATION	6
HOW AN AIR TRACK WORKS	8
NEWTON'S FIRST AND SECOND LAWS	9
NEWTON'S THIRD LAW	10
SIMPLE HARMONIC MOTION--THE STRINGLESS PENDULUM	11

PROD-EFL DIST-EFL

LEPAGE ELECTROSTATICS SERIES

FIVE FILMS REPRODUCING ELECTROSTATICS EXPERIMENTS PRODUCED ON A ''SHOE-STRING'' BASIS. ONE LOOP INCLUDES PROBLEMS BASED ON MATERIAL PRESENTED IN PRECEDING FILMS.

TITLE	PAGE
COULOMB'S LAW--VARIATION OF FORCE WITH CHARGE	19
COULOMB'S LAW--VARIATION OF FORCE WITH DISTANCE	19
ELECTRIC CHARGE	20
ELECTROSTATICS	20
TRANSFER AND DISTRIBUTION OF CHARGE	22

PROD-LEPG DIST-LEPG

LIGHT LIGHT SERIES

TITLE	PAGE
LENSES	25
REFRACTION	26
SHADOWS AND ECLIPSES	42

PROD-UWF DIST-UWF

MATH MATHEMATICS SERIES

TITLE	PAGE
PYTHAGORAS	50
SINE FUNCTION	50
TANGENT FUNCTION	51

PROD-NFBC DIST-NFBC

MECH MECHANICS SERIES

TITLE	PAGE
ENERGY AND THE PENDULUM	6
FORCE, MASS AND ACCELERATION	7
MOMENTUM AND THE PENDULUM	9
MOTION AT RIGHT ANGLES	9
MOTION IN A CIRCLE, PART I	9
MOTION IN A CIRCLE, PART II	9
UNIFORM ACCELERATION	12
UNIFORM LINEAR VELOCITY	12

PROD-ECTHEN DIST-FAC

MT BBC MATH TODAY SERIES

TITLE	PAGE
CLASSIFYING PATHS I	49
CLASSIFYING PATHS II	49
DOT LATTICE, A--PATTERNS OF NUMBERS IN SHAPES	49
INVERSES AND IDENTITIES (NUMBERS)	49
INVERSES AND IDENTITIES (PATHS)	49
PASCAL'S TRIANGLE	49
PUNCHED CARDS, TRUTH TABLES AND SWITCHES	57

PROD-GATE DIST-GATE

NCFMF NATIONAL COMMITTEE ON FLUID MECHANICS FILMS SERIES

FLUID MECHANICS FILMS BASED ON EXPERIMENTAL PHENOMENA USING SOPHISTICATED CAMERA TECHNIQUES TO BRING COMPLEX PHENOMENA WITHIN THE RANGE OF THE STUDENT. SINCE ALMOST ALL OF THE FILMS IN THE FLUID MECHANICS SECTION (PAGE 35) ARE FROM THIS SERIES, THE TITLES WILL NOT BE RELISTED HERE.

PROD-EDC DIST-EBF

NR NUCLEAR RADIATION SERIES

TITLE	PAGE
ATMOSPHERIC DISTRIBUTION OF NUCLEAR FALLOUT	29
BIOLOGICAL EFFECTS OF NUCLEAR RADIATION	29
NUCLEAR RADIATION DETECTORS, PART I	31
NUCLEAR RADIATION DETECTORS, PART II	31
NUCLEAR RADIATION DETECTORS, PART III	31

PROD-CENCO DIST-ICF

OB ORBITING BODIES SERIES

FIVE FILMS EXCERPTED FROM THE COMPUTER-ANIMATED FILM ''FORCE, MASS, AND MOTION'' BY FRANK SINDEN. TITLES ARE TENTATIVE.

TITLE	PAGE
FIXED SYSTEM OF ORBITING BODIES	7
MOVING SYSTEM OF ORBITING BODIES	9
NEWTON'S LAW OF MOTION	9
ORBITING BODIES IN VARIOUS FORCE FIELDS, PART I	10
ORBITING BODIES IN VARIOUS FORCE FIELDS, PART II	10

PROD-EDC DIST-SET F

PD PHYSICS DEMONSTRATIONS SERIES

TITLE	PAGE
ELECTROLYSIS	44
ELECTROSCOPE, THE	20
LESLIE'S CUBE	16
TYNDALL'S APPARATUS	18
WAVES IN A STRING	28

PROD-LOEW DIST-MGHT

PHYS PHYSICS SERIES

TITLE	PAGE
CARNOT CYCLE AND THE KELVIN TEMPERATURE SCALE	15
DOPPLER EFFECT	24
MEASUREMENT OF THE SPEED OF LIGHT	25
PROGRESSIVE WAVES--TRANSVERSE AND LONGITUDINAL	26
SIMPLE HARMONIC MOTION	11
STATIONARY LONGITUDINAL WAVES	27
STATIONARY TRANSVERSE WAVES	27
UNIFORM CIRCULAR MOTION	12

PROD-AP DIST-MGHT

PPB PILOT PROJECT IN PHYSICS IN BRAZIL

TWELVE LOOPS PRODUCED IN 1963-64 UNDER A UNESCO-SPONSORED PROJECT IN SAO PAULO, BRAZIL, TO DEVELOP TEACHING MATERIALS IN PHYSICS. THESE ARE MADE WITH A MINIMUM OF MATERIALS AND PROVIDE EXCELLENT EXAMPLES OF ''SHOE-STRING'' OPERATIONS.

TITLE	PAGE
COCK WITH MIRROR IMAGE	23
INFRARED RADIATION	16
LIGHT AND ELECTRONS	31
LIGHT AND PARTICLES I	25
LIGHT AND PARTICLES II	25
LIGHT, X-RAYS, GAMMA RAYS	25
PINHOLE CAMERA	26
RECTILINEAR PROPAGATION	26
REFLECTED LIGHT--GLASS IN LIQUIDS	26
TWO EXPERIMENTS WITH IMAGES	28

PROD-UNESCO DIST-UNESCO

PPC UNESCO PILOT PROJECT FOR CHEMISTRY TEACHING IN ASIA

FILMS PRODUCED BY A UNESCO WORKING GROUP IN BANGKOK, THAILAND, AS RESOURCE MATERIALS TO RAISE THE QUALITY OF CHEMISTRY TEACHING AT THE SCHOOL AND UNIVERSITY LEVEL IN ASIA.

TITLE	PAGE
CHANGES ON MIXING	43
CUS PUPIL EXPERIMENT	43
ENERGY TRANSFORMATION I	44
ENERGY TRANSFORMATION II	44
GAS REACTION (AMMONIA AND HYDROGEN CHLORIDE)	44
GAS REACTION (HYDROGEN AND OXYGEN)	44
PRECISION IN VOLUME MEASUREMENT	46
VOLUME CHANGES ON MIXING LIQUIDS I	47
VOLUME CHANGES ON MIXING LIQUIDS II	47

PROD-UNESCO DIST-WATTON

PPP PILOT PROJECT IN PHYSICS IN VENEZUELA

FILMS RESULTING FROM A UNESCO-SPONSORED PROJECT TO DEVELOP NEW TEACHING MATERIALS.

TITLE	PAGE
FOCUSING WAVES IN A RIPPLE TANK BY MEANS OF FRESNEL DIFFRACTION	24
PHOTOELECTRIC EFFECT	32
PULSES	10

PROD-UNESCO DIST-UNESCO

PSSC PHYSICAL SCIENCE STUDY COMMITTEE FILMS SERIES

A SET OF FILMS, PRODUCED TO ACCOMPANY THE PSSC HIGH SCHOOL PHYSICS COURSE, SHOWING BASIC EXPERIMENTS AND ELABORATING FUNDAMENTAL CONCEPTS IN PHYSICS.

TITLE	PAGE
ELECTRIC LINES OF FORCE	20
ELECTRONS IN A UNIFORM MAGNETIC FIELD	30
FORCES	7
FRAMES OF REFERENCE, PART I	7
FRAMES OF REFERENCE, PART II	7
MILLION TO ONE, A	9
PHOTOELECTRIC EFFECT	32

PROD-EDC DIST-SET B

QP QUANTUM PHYSICS SERIES

FIVE COMPUTER ANIMATED FILMS PRODUCED WITH THE COLLABORATION OF JUDAH SCHWARTZ.

TITLE	PAGE
SCATTERING IN ONE DIMENSION, PART I--BARRIERS	33
SCATTERING IN ONE DIMENSION, PART II--SQUARE WELLS	33
SCATTERING IN ONE DIMENSION, PART III--POTENTIAL WELLS	33
SCATTERING IN ONE DIMENSION--PART IV - MOMENTUM AND X-SPACE	33

PROD-SET P DIST-EDC

RFL RADIOACTIVITY FILM LOOPS SERIES

STUDIES OF TRACKS MADE BY ALPHA AND BETA PARTICLES IN A DIFFUSION CLOUD CHAMBER. THE RADIOACTIVE SPECIMEN IS ON ONE END OF A SMALL GLASS ROD HELD BY MEANS OF A CORK IN A HOLE IN THE COVER. A BLACKENED METAL DISC HOLDING A TRANSPARENT STABILIZING RING IS ATTACHED TO A METAL ROD WHICH EXTENDS THROUGH THE BASE OF THE CUP INTO A VACUUM FLASK UPON WHICH THE CHAMBER IS SUPPORTED. THESE 16MM LOOPS ARE SUPPLIED ON ONE REEL AND CAN BE CUT AND SPLICED INTO SEPARATE CLOSED LOOPS AND RUN ON ANY 16MM PROJECTOR.

TITLE	PAGE
RADIOACTIVITY 1	32
RADIOACTIVITY 2	32
RADIOACTIVITY 3	32
RADIOACTIVITY 4	32
RADIOACTIVITY 5	32

PROD-HEIL DIST-WELCH

RT RIPPLE TANK SERIES

A SERIES OF FIVE RIPPLE TANK DEMONSTRATION FILMS.

TITLE	PAGE
DIFFRACTION AT AN APERTURE	24
INTERFERENCE	24
PLANE AND SPHERICAL WAVES--DIFFRACTION AT OBSTACLES	26
REFLECTION AT PLANE AND CURVED SURFACES	26
REFRACTION	26

PROD-HB DIST-EBF

RTT RADIO TECHNICIAN TRAINING SERIES

TITLE	PAGE
AMPERES, VOLTS AND OHMS	19
SIGNAL GENERATOR OPERATION	58

PROD-USN DIST-USN

RTWP RIPPLE TANK WAVE PHENOMENA SERIES

SERIES OF 14 FILMS ON WAVE PHENOMENA USING A GLASS-BOTTOM RIPPLE TANK. LIGHT FROM A SOURCE BELOW THE TANK IS PROJECTED THROUGH THE WATER AND FOCUSED BY THE CURVATURE OF THE WATER WAVES ONTO A SCREEN ABOVE THE TANK. THE PATTERN ON THE SCREEN IS THEN PHOTOGRAPHED. MUCH OF THE MATERIAL WAS DERIVED FROM ''REFLECTION AND REFRACTION,'' ''INTERFERENCE AND DIFFRACTION,'' AND ''BARRIER PENETRATION--BRAGG REFLECTION--DOPPLER EFFECT,'' THREE 16MM FILMS BY JAMES STRICKLAND.
COLLABORATOR--JAMES STRICKLAND

TITLE	PAGE
BARRIER PENETRATION	23
BARRIER PENETRATION BY WAVES	23
BRAGG REFLECTION	23
BRAGG REFLECTION OF WAVES	23
CIRCULAR WAVE REFLECTION FROM VARIOUS BARRIERS	23
DIFFRACTION AND SCATTERING AROUND OBSTACLES	24
DOPPLER EFFECT	24
DOPPLER EFFECT AND SHOCK WAVES	24
EFFECT OF PHASE DIFFERENCES BETWEEN SOURCES	24
FORMATION OF SHOCK WAVES	36
INTERFERENCE OF WAVES	24
MULTIPLE SLIT DIFFRACTION	26
REFLECTION OF WAVES FROM CONCAVE BARRIERS	26
REFRACTION OF WAVES	27
SINGLE SLIT DIFFRACTION	27
STRAIGHT WAVE REFLECTION FROM STRAIGHT BARRIERS	27
SUPERPOSITION OF PULSES	27

PROD-EDC DIST-SET F(8MM), SET B(16MM)

SG SOLDER GLASS DEMONSTRATIONS SERIES

SEVEN LOOPS EXCERPTED FROM ''A LABORATORY HIGH-VACUUM TECHNIQUE USING SOLDER GLASS'' BY JAN ORSULA. TITLES ARE TENTATIVE.

TITLE	PAGE
FIRING THE GETTERS	54
MAKING AN ANODE STRUCTURE	55
PREPARING AND BAKING A SOLDER GLASS SEAL	57
PREPARING A DIODE HEADER	57
PREPARING THE GETTER HEADER	57
SEALING-OFF THE SMALL HEADER TUBES	57
TESTING FOR LEAKS AND OUTGASSING	58

PROD-EDC DIST-SET F

SR THE SLIDE RULE SERIES

A CIRCULAR SAW AND WOODEN BLOCKS ARE USED TO CONSTRUCT A PRIMITIVE RULE, ILLUSTRATING THE PRINCIPLES ON WHICH THE SLIDE RULE WORKS. NUMERICAL READINGS ARE IDENTIFIED BY COLOR CODED STRIPS. THE K12 RULE DESIGNED BY KEUFFEL AND ESSER CORPORATION IS USED BUT THE FILMS ARE COMPATIBLE WITH OTHER COMMON BRANDS OF ELEMENTARY RULES.
COLLABORATOR--R. B. WILLIAMSON

TITLE	PAGE
SLIDE RULE, THE--CI SCALE	50
SLIDE RULE, THE--DIVISION, C AND D SCALES	50
SLIDE RULE, THE--MULTIPLICATION, C AND D SCALES	50
SLIDE RULE, THE--READING AND HANDLING	50
SLIDE RULE, THE--SQUARES, CUBES, AND ROOTS	50
SLIDE RULE, THE--THREE-DIGIT PRACTICE	50
SLIDE RULE, THE--TWO-DIGIT PRACTICE	50
SLIDE RULE, THE--WHY IT WORKS	50

PROD-EFL DIST-EFL

SS SPACE SCIENCE SERIES

TITLE	PAGE
COMET ORBITS	41
ECLIPSE OF THE MOON	41
ECLIPSE OF THE SUN	41
EXPERIMENTAL WEIGHTLESSNESS	6
FREE FALL IN SPACE	7
MARS AND JUPITER	42
SOLAR FLARES	42
SOLAR PROMINENCES	42

PROD-EOTHEN DIST-FAC

TDKT TWO-DIMENSIONAL KINETIC THEORY GAS MODEL

TITLE	PAGE
BROWNIAN MOTION	
PART III--CHARLES' LAW	46
PART IV--EFFECT OF LEAKS	46
RANDOM MOTION	

PROD-ZUR DIST-ZUR

VK VECTOR KINEMATICS SERIES

DISPLACEMENT, VELOCITY AND ACCELERATION VECTORS OF CERTAIN MOTIONS PROGRAMMED ON A COMPUTER AT MIT'S LINCOLN LABORATORY AND PHOTOGRAPHED FROM AN OSCILLOSCOPE FACE. VECTOR QUANTITIES ARE DISPLAYED CONTINUOUSLY AND ALMOST SIMULTANEOUSLY FOR SUCCESSIVE POSITIONS OF THE MOVING SPOT.

TITLE	PAGE
ACCELERATION VECTOR, THE	5
VELOCITY AND ACCELERATION IN CIRCULAR MOTION	12
VELOCITY AND ACCELERATION IN FREE FALL	12
VELOCITY AND ACCELERATION IN SIMPLE HARMONIC MOTION	12
VELOCITY IN CIRCULAR AND SIMPLE HARMONIC MOTION	12
VELOCITY VECTOR, THE	13

PROD-EDC DIST-SET F

WAVE-G WAVE MOTION SERIES

A SERIES OF RIPPLE TANK DEMONSTRATIONS ON INTERFERENCE AND DIFFRACTION USING AN APPLICATION OF THE SCHLIEREN TECHNIQUE SUPPLEMENTED WITH SHOTS OF OPTICAL EXPERIMENTS.
COLLABORATOR--W. LLOWARCH

TITLE	PAGE
AT AN APERTURE (FIXED WAVELENGTH)	23
AT AN APERTURE (WAVELENGTH VARIED)	23
AT A NARROW OBSTACLE	23
AT A STRAIGHT EDGE	23
CHANGE OF FREQUENCY	23
CHANGE OF PHASE	23
MOVEMENT OF TWO SOURCES	25
TWO SOURCES IN PHASE	28

PROD-GATE DIST-ICF

WAVE-H WAVE MOTION SERIES

THIRTEEN 16MM FILM LOOPS PROVIDING A GRAPHICAL STUDY OF WAVE MOTION. THE LOOPS ARE SUPPLIED ON ONE REEL AND CAN BE CUT APART AND SPLICED INTO SEPARATE CLOSED LOOPS AND RUN ON ANY 16MM PROJECTOR.

TITLE	PAGE
BEATS	23
LONGITUDINAL WAVE WITH DISPLACEMENT FUNCTION	25
LONGITUDINAL WAVE WITH PRESSURE FUNCTION	25
OPPOSITE VELOCITIES AND DIFFERENT FREQUENCIES	26
PARTIAL STANDING WAVE	26
SIMPLE HARMONIC MOTION	27
STANDING WAVE	27
SUM OF IDENTICAL WAVES NOT IN PHASE AGREEMENT	27
SUM OF TWO IDENTICAL WAVES	27
SUM OF TWO WAVES OF DIFFERENT FREQUENCY	27
TRANSVERSE WAVES, SAME FREQUENCY	28
TRANSVERSE WAVES, SAME VELOCITY	28
VELOCITY, FREQUENCY AND WAVELENGTH	28

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TITLE	PAGE
ACID BASE REACTION IN ELECTROLYSIS OF WATER	43
BOMB CALORIMETER, THE	43
BUILDING ATOM MODELS--ISOMERISM	43
CROOKE'S TUBES	29
CRYOGENIC PUMP	54
DIFFUSION PUMP--MERCURY VAPOR	54
DIFFUSION PUMP--OIL VAPOR	54
DR. BLACK'S OBSERVATIONS ON HEAT	44
ELECTRONEGATIVITY	44
E/M DEMONSTRATION	54
FAST REACTION--MERCURY AND SILVER NITRATE	44
GEIGER COUNTER	30
HYDROGEN GENERATOR--MARSH TEST	44
ION PUMP	55
ION REMOVAL BY METATHESIS	45
LE CHATELIER'S PRINCIPLE	45
MECHANICAL PUMPS--FORE PUMPS	55
MECHANICAL PUMPS--MOLECULAR PUMPS	55
MELTING POINTS (RELATION TO PERIOD TABLE)	45
METALS AND NON-METALS	45
MILLIKAN'S OIL DROP EXPERIMENT	31
MOVEMENT IN CRYSTAL GROWTH	45
PHASE DEMONSTRATION	17
PROPERTIES OF MIXTURES AND COMPOUNDS	46
PROTON MOTIONS IN ICE	46
SLOW REACTION--IRON AND OXYGEN	46
SOLUTION, EVAPORATION, AND CRYSTALLIZATION	47
STATIC ELECTRICITY--INDUCTION	22
SULFUR, ITS PHYSICAL STATES AND PROPERTIES	47
VAPOR PRESSURE	47
VERY FAST REACTION--AMMONIUM DICHROMATE	47
WATER ASPIRATOR	47

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Appendix II

Series Descriptions

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11559 SANTA MONICA BOULEVARD
LOS ANGELES, CALIFORNIA 90025

FAIR ROBERT FAIRTHORNE

FANTON G. FANTON
LABORATOIRE DE PHYSIQUE INDUSTRIELLE
FACULTE DES SCIENCES
MARSEILLES, FRANCE

FOWLER JOHN M. FOWLER
COMMISSION ON COLLEGE PHYSICS
DEPARTMENT OF PHYSICS
UNIVERSITY OF MARYLAND
COLLEGE PARK, MARYLAND 20740

FRAN M. FRANCON
LABORATOIRE DE L'INSTITUT D'OPTIQUE THEORIQUE ET APPLIQUEE
PARIS, FRANCE

FREM CULTURAL SERVICE
EMBASSY OF FRANCE
WASHINGTON, D.C.

FWU INSTITUT FUR FILM UND BILD IN
WISSENSCHAFT UND UNTERRICHT
8 MUNICH 26
MUSEUMSINSEL 1, GERMANY

GATE GATEWAY EDUCATIONAL FILMS, LTD.
470-472 GREEN LANES
PALMERS GREEN
LONDON, N. 13, ENGLAND

GE GENERAL ELECTRIC CORPORATION
RESEARCH LABORATORY
P. O. BOX 1088
SCHENECTADY, NEW YORK 12301

GRON F. GRONLUND
LABORATOIRE DE CHEMIE MINERALE B
FACULTE DES SCIENCES
PARIS, FRANCE

HAN WILLIAM S. HANNAN, JR.
EMPIRE ZINC COMPANY
HANOVER, NEW MEXICO 88041

HB HALAS AND BATCHELOR CARTOON FILMS, LTD.
LYSBETH HOUSE
10A SOHO SQUARE
LONDON, W. 1, ENGLAND

HEIL JOHN J. HEILEMANN
DEPARTMENT OF PHYSICS
URSINUS COLLEGE
COLLEGEVILLE, PENNSYLVANIA 19426

HUNT HILLARD B. HUNTINGTON
DEPARTMENT OF PHYSICS
RENSSELAER POLYTECHNIC INSTITUTE
TROY, NEW YORK 12181

IAEA INTERNATIONAL ATOMIC ENERGY AGENCY
PUBLIC INFORMATION DIVISION
KAERNTNERRING 11
VIENNA 1, AUSTRIA

IBM INTERNATIONAL BUSINESS MACHINES
DIRECTOR OF INFORMATION
FEDERAL SYSTEMS DIVISION
326 EAST MONTGOMERY AVENUE
ROCKVILLE, MARYLAND 20850

ICF COMMUNICATIONS FILMS
INTERNATIONAL COMMUNICATIONS FOUNDATION
870 MONTEREY PASS ROAD
MONTEREY PARK, CALIFORNIA 91754

IFB INTERNATIONAL FILM BUREAU, INC.
332 SOUTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60604

ILL AUDIO-VISUAL CENTER
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS 61801

IVAC INTERNATIONAL VISUAL AIDS CENTER
691 CHAUSSEE DE MONS
BRUSSELS 7, BELGIUM

IWF INSTITUT FUR DEN WISSENSCHAFTLICHEN FILM
NONNENSTIEG 72,
KAERNTNERRING 11
34 GOTTINGEN
GERMANY

JMJ A. J. M. JOHNSON
DEPARTMENT OF PHYSICS
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA 59715

JOEL NAHUM JOEL
DIVISION OF SCIENCE TEACHING
UNESCO DEPARTMENT OF ADVANCEMENT
PLACE DE FONTENOY
PARIS 7E, FRANCE

JPL JET PROPULSION LABORATORY
PHOTOGRAPHIC SERVICES
FILM LIBRARY
4800 OAK GROVE DRIVE
PASADENA, CALIFORNIA 91103

KYOTO
KYOTO UNIVERSITY FOR INDUSTRIAL
ARTS AND TEXTILES
KYOTO, JAPAN

LABTV
LAB-TV
723 SEVENTH AVENUE
NEW YORK, NEW YORK 10019

LASL
LOS ALAMOS SCIENTIFIC LABORATORY
P. O. BOX 1663
ATTN.--REPORT LIBRARIAN
LOS ALAMOS, NEW MEXICO 87544

LEPG
W. R. LEPAGE
L. C. SMITH COLLEGE OF ENGINEERING
SYRACUSE UNIVERSITY
SYRACUSE, NEW YORK 13210

LMAF
LOOKOUT MOUNTAIN LABORATORY
U. S. AIR FORCE
8935 WONDERLAND AVENUE
HOLLYWOOD, CALIFORNIA 90028

LOEW
LOEW'S INTERNATIONAL CORPORATION
1540 BROADWAY
NEW YORK, NEW YORK 10012

LRL
LAWRENCE RADIATION LABORATORY
P. O. BOX 808
LIVERMORE, CALIFORNIA 94550

MAC
MACMILLAN AND COMPANY, LTD.
LITTLE ESSEX STREET
LONDON W.C. 2, ENGLAND

MERI
R. MERIGOUX
LABORATOIRE DE PHYSIQUE INDUSTRIELLE
FACULTE DES SCIENCES
MARSEILLES, FRANCE

MGHT
MCGRAW-HILL BOOK COMPANY
TEXT-FILM DIVISION
330 WEST 42ND STREET
NEW YORK, NEW YORK 10036

MILLER
FRANKLIN MILLER
DEPARTMENT OF PHYSICS
KENYON COLLEGE
GAMBIER, OHIO 43022

MIT
DEPARTMENT OF METALLURGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

MLA
MODERN LEARNING AIDS
1212 AVENUE OF THE AMERICAS
NEW YORK, NEW YORK 10036

MSC
MACALASTER SCIENTIFIC CORPORATION
60 ARSENAL STREET
WATERTOWN, MASSACHUSETTS 02172

MULTI
N. V. MULTIFILM
STEYLANN 1,
HILVERSUM, THE NETHERLANDS

NAA
NORTH AMERICAN AVIATION
SPACE AND INFORMATION DIVISION
12214 LAKEWOOD BOULEVARD
DOWNEY, CALIFORNIA 90241

NASA
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
1520 H STREET, N. W.
WASHINGTON, D.C. 20025

NBS
NATIONAL BUREAU OF STANDARDS
OFFICE OF TECHNICAL INFORMATION AND
PUBLICATIONS
WASHINGTON, D. C. 20234

NFBC
NATIONAL FILM BOARD OF CANADA
DISTRIBUTION BRANCH
P. O. BOX 6100
MONTREAL 3, QUEBEC
CANADA

NIF
NATIONAL INSTRUCTIONAL FILMS
58 EAST ROUTE 59
NANUET, NEW YORK 10954

NOR
THOMAS NORTON
LINTON HIGH SCHOOL
SCHENECTADY, NEW YORK

NSFL
NATIONAL SCIENCE FILM LIBRARY
CANADIAN FILM INSTITUTE
OTTAWA, ONTARIO
CANADA

NUFF
NUFFIELD FOUNDATION
MARY WARD HOUSE
TAVISTOCK PLACE
LONDON, W.C. 1, ENGLAND

OBAF
OFFICE BELGE POUR L' ACCROISSEMENT

OUDAR
J. OUDAR
LABORATOIRE DE CHEMIE MINERALE B
FACULTE DES SCIENCES
PARIS, FRANCE

OUELL
ROBERT OUELLETTE
DEPARTMENT OF CHEMISTRY
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43210

PALMER
W. A. PALMER FILMS, INC.
611 HOWARD STREET
SAN FRANCISCO, CALIFORNIA 94105

PARS
T. D. PARSONS
DEPARTMENT OF CHEMISTRY
OREGON STATE UNIVERSITY
CORVALLIS, OREGON 97331

PHIL
N. V. PHILIPS' GLOEILAMPENFABRIEKEN
EINDHOVEN, THE NETHERLANDS

PPGC
PITTSBURGH PLATE GLASS COMPANY
PITTSBURGH, PENNSYLVANIA

PURDUE
AUDIO VISUAL CENTER
PURDUE UNIVERSITY
LAFAYETTE, INDIANA 47907

RANK
RANK FILM LIBRARY
1 AINTREE ROAD
PERIVALE, GREENFORD
MIDDLESEX, ENGLAND

RMCS
ROYAL MILITARY COLLEGE OF SCIENCE
CHEMISTRY BRANCH
SHRIVENHAM, BERKS.
ENGLAND

RUG
N. MACGREGOR RUGHEIMER
DEPARTMENT OF PHYSICS
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA 59715

SAL
GERHARD L. SALINGER
DEPARTMENT OF PHYSICS
RENSSELAER POLYTECHNIC INSTITUTE
TROY, NEW YORK 12181

SALT
BRIAN SALT

SDC
SYSTEM DEVELOPMENT CORPORATION
2500 COLORADO AVENUE
SANTA MONICA, CALIFORNIA 90406

SE
SCIENCE ELECTRONICS
SIMON AND LEDGE STREETS
NASHUA, NEW HAMPSHIRE 03060

SERO
R. SEROPLAY
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
LABORATOIRE DE L'OBSERVATOIRE DU PUY-DE-DOME
96 BOULEVARD RASPAIL
PARIS 6E, FRANCE

SFC
STATENS FILMCENTRAL
27, VESTERGADE
COPENHAGEN K, DENMARK

SFRS
SERVICE DU FILM DE RECHERCHE SCIENTIFIQUE
96 BOULEVARD RASPAIL
PARIS 6E, FRANCE

SHELL SHELL INTERNATIONAL PETROLEUM COMPANY, LTD.
SHELL CENTER
LONDON, S.E. 1, ENGLAND

SINDEN FRANK W. SINDEN
BELL TELEPHONE LABORATORIES
MURRAY HILL, NEW JERSEY 07971

SLAB WENDALL SLABAUGH
DEPARTMENT OF CHEMISTRY
OREGON STATE UNIVERSITY
CORVALLIS, OREGON 97331

SPED H. R. SPEDDEN, DIRECTOR
KENNECOTT COPPER CORPORATION
RESEARCH CENTER
1515 MINERAL SQUARE
SALT LAKE CITY, UTAH 84111

SPO SACRAMENTO PEAK OBSERVATORY
AIR FORCE CAMBRIDGE RESEARCH LABORATORIES
SUNSPOT, NEW MEXICO 88349

SRA SCIENCE RESEARCH ASSOCIATES
259 ERIE STREET
CHICAGO, ILLINOIS 60611

STC SCIENCE TEACHING CENTER
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

STP ST. PAUL'S FILMS
SOCIETY OF ST. PAUL
MIDDLE GREEN
LANGLEY BUCKS., ENGLAND

SUTH SUTHERLAND EDUCATIONAL FILMS, INC.
201 NORTH OCCIDENTAL BOULEVARD
LOS ANGELES, CALIFORNIA 90026

TECH TECHNICOLOR, LTD.
BATH ROAD
HARMONDWORTH
WEST DRAYTON
MIDDLESEX, ENGLAND

TEK FILMS LIBRARY
TEKTRONIX, INC.
P. O. BOX 500
BEAVERTON, OREGON 97005

THORNE THORNE FILMS, INC.
1229 UNIVERSITY AVENUE
BOULDER, COLORADO 80302

TOYE M. J. TOYE
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
LABORATOIRE DE L'OBSERVATOIRE DU PUY-DE-DOME
96 BOULEVARD RASPAIL
PARIS 6E, FRANCE

TRESS GEORGE TRESSEL PRODUCTIONS
CHICAGO, ILLINOIS

UNESCO DIVISION OF SCIENCE TEACHING
DEPARTMENT OF ADVANCEMENT
UNITED NATIONS ECONOMIC, SOCIAL, AND
CULTURAL ORGANIZATION
PLACE DE FONTENOY
PARIS 7E, FRANCE

USAF USAF FILM LOAN
AIR FORCE FILM LIBRARY CENTER
8900 SOUTH BROADWAY
ST. LOUIS, MISSOURI 63125

USIA UNITED STATES INFORMATION AGENCY
WASHINGTON, D. C.

USN U. S. NAVY, COMMANDANT
U. S. NAVAL STATION
WASHINGTON NAVY YARD ANNEX
WASHINGTON, D. C.

USOE U. S. OFFICE OF EDUCATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
WASHINGTON, D. C. 20202

UWF UNIVERSAL EDUCATION AND VISUAL ARTS
(FORMERLY UNITED WORLD FILMS)
EDUCATION DEPARTMENT
221 PARK AVENUE SOUTH
NEW YORK, NEW YORK 10003

VEF VISUAL EDUCATION FILMS, INC.

WARD J. WARD
CRYSTALLOGRAPHY LABORATORY
INSTITUTE OF PHYSICS AND MATHEMATICS
SANTIAGO, CHILE

WAT E. C. WATTON, DIRECTOR
UNESCO PILOT PROJECT FOR
CHEMISTRY TEACHING IN ASIA
P. O. BOX 1425
BANGKOK, THAILAND

WAYNE AUDIO VISUAL DEPARTMENT
WAYNE STATE UNIVERSITY
DETROIT, MICHIGAN 48202

WEC WESTERN ELECTRIC COMPANY
MOTION PICTURE BUREAU
195 BROADWAY
NEW YORK, NEW YORK 10014

WELCH W. M. WELCH SCIENTIFIC COMPANY
7300 NORTH LINDER AVENUE
SKOKIE, ILLINOIS 60076

WWA WORLD WIDE ANIMATIONS, LTD.
44, CLAPHAM HIGH STREET
LONDON, S.W. 4, ENGLAND

WWP WORLD WIDE PICTURES, LTD.
34 CURSITOR STREET
LONDON, E.C. 4, ENGLAND

YALE YALE UNIVERSITY
DEPARTMENT OF CHEMISTRY
NEW HAVEN, CONNECTICUT 36520

ZORA ZORA FILMS OF YUGOSLAVIA
BELGRAD, YUGOSLAVIA

ZUR FRED ZURHEIDE
FACULTY OF PHYSICAL SCIENCE
SOUTHERN ILLINOIS UNIVERSITY
ALTON, ILLINOIS 62025

SET A
EBASCO SERVICES, INC.
BABCOCK AND WILCOX COMPANY
PHILLIPS PETROLEUM

SET B
MODERN LEARNING AIDS
UNIVERSAL EDUCATION AND VISUAL ARTS

SET D
G. L. SALINGER
H. B. HUNTINGTON

SET E
NAHUM JOEL
J. WARD

SET F
CANADIAN LABORATORY SUPPLIES, LTD. (8,16--TC,RE)
EALING CORPORATION (8,8S,16--TC,RE)
MACALASTER SCIENTIFIC CORPORATION (8,16--TC,RE)
MCGRAW-HILL COMPANY (ONLY IN SERIES)
MODERN LEARNING AIDS (8,16--TC,RE)
NATIONAL INSTRUCTIONAL FILMS (8,8S--TC)
SCIENCE ELECTRONICS (8,16--TC,RE)
UNIVERSAL EDUCATION AND VISUAL AIDS (8--TC)

SET G
WENDELL SLABAUGH
THERON D. PARSONS

SET K
N. MACGREGOR RUGHEIMER
A. J. M. JOHNSON

SET L
ROBERT FAIRTHORNE
BRIAN SALT

SET M
R. SEROPLAY
M. J. TOYE

SET N
R. MERIGOUX
G. FANTON

SET O
H. R. SPEDDEN
WILLIAM S. HANNAN, JR.

SET P
SCIENCE TEACHING CENTER
EDUCATION DEVELOPMENT CENTER

Appendix III

List of Computer-Animated Films

Computer animation enables a physicist to translate numerical formulations into pictures. These pictures can be displayed on a computer-controlled cathode ray tube, photographed successively, and viewed as a motion picture. Thus students and teachers can visualize concepts and formulations in three dimensions which until now could only be displayed on a two-dimensional blackboard. Below is a list of short physics films already available to the teacher which make use of the computer's display potential. A more detailed description of the process and capabilities of computer-generated film appears in the report of the Conference on Single Concept Films in College Physics Teaching, available from the Commission on College Physics.

TITLE	PAGE
Advance of Perihelion	41
Computer Animation Examples	53
Computer I	41
Computer II—Program Orbit	41
Computer Studies of Fluid Dynamics	35
Field System of Orbiting Bodies	7
Force, Mass, and Motion	7
Harmonic Phasors	24
Kepler's Law	42
Moving System of Orbiting Bodies	9
Newton's Law of Motion	9
Orbit Graphing by Iteration	42
Orbiting Bodies in Various Force Fields—Part I	10
Orbiting Bodies in Various Force Fields—Part II	10
Quantum Mechanical Harmonic Oscillator	32
Rutherford Scattering	32
Scattering in One Dimension,—Part I Barriers	33
Scattering in One Dimension, Part II—Square Wells	33
Scattering in One Dimension, Part III—Potential Wells	33
Scattering in One Dimension, Part IV—Momentum and X-Space	33
Scattering of Quantum Mechanical Wave Packets from Potential Well and Barrier	33
Simulation of a Two-Gyro Gravity-Gradient Attitude Control System	42
Superposition	27
Two Paradoxes	58
Velocity and Acceration in Circular Motion	12
Velocity and Acceleration in Free Fall	12
Velocity and Acceleration in Simple Harmonic Motion	12
Velocity in Circular and Simple Harmonic Motion	12
Velocity Vector, The	13

Appendix IV

Leading University Audio-Visual Libraries

BELOW IS A LIST OF UNIVERSITY AUDIO-VISUAL LIBRARIES WHICH HAVE SIZEABLE FILM COLLECTIONS AVAILABLE FOR RENTAL OR LOAN. MANY ISSUE CATALOGUES OF THEIR HOLDINGS ON REQUEST.

AUDIO-VISUAL CENTER
ARIZONA STATE UNIVERSITY
TEMPE, ARIZONA 85281

FILM LIBRARY SUPERVISOR
EXTENSION DIVISION
UNIVERSITY OF CALIFORNIA, BERKELEY
BERKELEY, CALIFORNIA 94720

AUDIO-VISUAL CENTER
UNIVERSITY OF CONNECTICUT
STORRS, CONNECTICUT 06268

AUDIO-VISUAL CENTER
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA 32306

GEORGIA CENTER FOR CONTINUING EDUCATION
UNIVERSITY OF GEORGIA
ATHENS, GEORGIA 30601

AUDIO-VISUAL AIDS SERVICE
SOUTHERN ILLINOIS UNIVERSITY
CARBONDALE, ILLINOIS 62903

VISUAL AIDS SERVICE
UNIVERSITY OF ILLINOIS
CHAMPAIGN, ILLINOIS 61820

AUDIO-VISUAL CENTER
INDIANA UNIVERSITY
BLOOMINGTON, INDIANA 47401

AUDIO-VISUAL CENTER
PURDUE UNIVERSITY
LAFAYETTE, INDIANA 47907

BUREAU OF AUDIO-VISUAL INSTRUCTION
EXTENSION DIVISION
STATE UNIVERSITY OF IOWA
IOWA CITY, IOWA 52240

BUREAU OF VISUAL INSTRUCTION
UNIVERSITY EXTENSION
UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

ABRAHAM KRASKER MEMORIAL FILM LIBRARY
BOSTON UNIVERSITY
SCHOOL OF EDUCATION
765 COMMONWEALTH AVENUE
BOSTON, MASSACHUSETTS 02215

AUDIO-VISUAL EDUCATION CENTER
THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN 48104

AUDIO-VISUAL CENTER
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN 48823

AUDIO-VISUAL EXTENSION SERVICE
UNIVERSITY OF MINNESOTA
2037 UNIVERSITY AVENUE, S.E.
MINNEAPOLIS, MINNESOTA 55414

AUDIO-VISUAL CENTER
UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE 03824

AUDIO-VISUAL EDUCATION
STATE DEPARTMENT OF EDUCATION
TRENTON, NEW JERSEY

NEW YORK UNIVERSITY FILM LIBRARY
WASHINGTON SQUARE
NEW YORK, NEW YORK 10033

EDUCATIONAL FILM LIBRARY
SYRACUSE UNIVERSITY
COLLENDALE CAMPUS
BUILDING D-7
SYRACUSE, NEW YORK 13210

BUREAU OF AUDIO-VISUAL EDUCATION
UNIVERSITY OF NORTH CAROLINA
CHAPEL HILL, NORTH CAROLINA 27514

AUDIO-VISUAL SERVICES
DIVISION OF CONTINUING EDUCATION
COLISEUM 131
CORVALLIS, OREGON 97330

AUDIO-VISUAL AIDS LIBRARY
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PENNSYLVANIA 16802

SCHOOL OF GENERAL STUDIES
AUDIO-VISUAL AIDS BUREAU
UNIVERSITY OF SOUTH CAROLINA
COLUMBIA, SOUTH CAROLINA 29208

VISUAL INSTRUCTION BUREAU
UNIVERSITY OF TEXAS
AUSTIN, TEXAS 78712

AUDIO-VISUAL CENTER
BRIGHAM YOUNG UNIVERSITY
PROVO, UTAH 84601

AUDIO-VISUAL SERVICES
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98105

BUREAU OF VISUAL INSTRUCTION
UNIVERSITY OF WISCONSIN
1312 WEST JOHN STREET
MADISON, WISCONSIN 53706

Short Films for Physics Teaching

Additions and/or Corrections

The Commission on College Physics plans to periodically revise and update the catalog of short films in physics and calls upon members of the physics profession and related disciplines to keep it informed both of new films which come to their attention and of errors in the current catalog. Where possible, please indicate precise title and producer. *Send revisions and information to:* Commission on College Physics, Department of Physics, University of Maryland, 4321 Hartwick Road, College Park, Maryland. Additional copies of this form are available from the Commission office; reproductions are acceptable.

ADDITIONS:

Title____

Producer_______________________________________

Title____

Producer_______________________________________

Title____

Producer_______________________________________

CORRECTIONS:

Title________________________________ Page_______

Item (s) to be corrected______________________________

Title________________________________ Page_______

Item (s) to be corrected______________________________

Title________________________________ Page_______

Item (s) to be corrected______________________________

Submitted by ________________________

____

____

____

Film Evaluation Questionnaire

The Commission on College Physics is attempting to compile evaluations of films which are being or have been used in physics courses. Would you please help us by evaluating on the form below films with which you have had classroom experience as well as those which you have considered for class use. As many as five films can be evaluated at one time. This form may be reproduced or copies obtained from the CCP. *Return completed forms to:* Commission on College Physics, Department of Physics, University of Maryland, 4321 Hartwick Road, College Park. Maryland.

Film Titles #1 ______________________ **Producer** ______________
#2 ______________________ **Producer** ______________
#3 ______________________ **Producer** ______________
#4 ______________________ **Producer** ______________
#5 ______________________ **Producer** ______________

I. Please indicate, following the code explained below, at what educational level you used the films listed above, how you used them, and what your evaluations of them are at these levels and for these uses:

Film	Level	Use	Evaluation
#1			
#2			
#3			
#4			
#5			

CODE

Level
- A. Elementary school
- B. High school general science
- C. High school physics
- D. College nonscientists
- E. College introductory physics
- F. College upper division
- G. Graduate school

Use
- A. Lecture presentations of subject manner
- B. Background material in lecture.
- C. Self-study material
- D. Instruction in lab technique
- E. Other (please specify) ______________
  ____

Evaluation
- A. Excellent
- B. Very good
- C. Good
- D. Fair
- E. Poor
- F. Unacceptable

II. Please indicate, using the same code as in I, the level and use for which you think the films are most suited, and give your evaluation of them for that use at that level. If there are other uses at different levels which you think are worth considering, please indicate them also.

	Most suitable			Suitable		
Film	Level	Use	Eval.	Level	Use	Eval.
#1						
#2						
#3						
#4						
#5						

III. Please add comments on any of the above films, criticism of its technique or its physics, suggestions for improvements or companion films (feel free to add comments on a separate sheet).

Submitted by ______________________
____
____
____

Index

A

ABLATION OF ICE MODELS IN A WATER TUNNEL 35
ABSORPTION SPECTRA 29
AC AND DC 19
ACCELERATION 5
ACCELERATION DUE TO GRAVITY--METHOD I 5
ACCELERATION DUE TO GRAVITY--METHOD II 5
ACCELERATION VECTOR, THE 5
AC DYNAMO 53
ACID BASE REACTION IN ELECTROLYSIS OF WATER 43
ACTIVE ELEMENT, THE 53
ADVANCED TEST REACTOR 29
ADVANCE OF PERIHELION 41
AIR HAS WEIGHT 15
AIR OCCUPIES SPACE 15
AIR SUPPORTS WATER IN AN INVERTED TUMBLER 53
ALKALI METAL REACTIONS WITH CHLORINE AND WITH WATER 43
ALTERNATING CURRENT (DANISH) 19
AMPERES, VOLTS AND OHMS 19
AMPLITUDE MODULATOR, THE 53
ANALYSIS OF SOLIDS 53
ANALYSIS OF SOLIDS WITH THE MS-7 MASS SPECTROMETER 53
ANALYTICAL BALANCE--TARE WEIGHT DETERMINATION 43
ANALYTICAL BALANCE--WEIGHING SAMPLE AND CONTAINER 43
ANGULAR MOMENTUM--A VECTOR QUANTITY 5
ARCHIMEDES' PRINCIPLE 43
ARGONNE FAST SOURCE REACTOR 29
ASSEMBLING THE ELECTRIC MOTOR 53
ASTON'S MASS SPECTROGRAPH 29
ASTRONOMER, THE 41
AT AN APERTURE (FIXED WAVELENGTH) 23
AT AN APERTURE (WAVELENGTH VARIED) 23
AT A NARROW OBSTACLE 23
AT A STRAIGHT EDGE 23
ATMOSPHERIC DISTRIBUTION OF NUCLEAR FALLOUT 29
ATMOSPHERIC STABILITY AND INSTABILITY--STABILITY AND THE WEATHER 15
ATOMIC AND BONDING ORBITALS 43
ATOMIC ENERGY 29
ATOMIC THEORY, THE 29
AUDIO FREQUENCY POWER AMPLIFIER, THE 53
AUDIO FREQUENCY VOLTAGE AMPLIFIER, THE 53
AUDIO OSCILLATOR OPERATION 53
AURORA BOREALIS (GERMAN) 41
AVERAGE SPEED 5

B

BARRIER PENETRATION 23
BARRIER PENETRATION BY WAVES 23
BASIC ELECTRICITY--AC PARALLEL CIRCUITS 19
BASIC ELECTRICITY--AC SERIES CIRCUITS 19
BASIC ELECTRICITY--CAPACITANCE IN AC CIRCUITS 19
BASIC ELECTRICITY--INDUCTANCE IN AC CIRCUITS 19
BASIC PRINCIPLES OF POWER REACTORS 53
BATHUB VORTEX 35
BEATS 23
BEATS, THE (FRENCH) 23
BETA RAY SPECTROMETER 29
BIOLOGICAL EFFECTS OF NUCLEAR RADIATION 29
BOILING FROM A LIQUID-LIQUID INTERFACE 43
BOMB CALORIMETER, THE 43
BOUNDARY LAYER FORMATION 35
BOW WAVES IN HYPERSONIC FLOW 35
BRAGG REFLECTION 23
BRAGG REFLECTION OF WAVES 23
BREAKDOWN OF LEADING-EDGE VORTICES ON DELTA WING IN SUBSONIC FLOW 35
BREAKUP OF LIQUID INTO DROPS 35
BROWNIAN MOTION 17
BROWNIAN MOTION (GERMAN) 15
BROWNIAN MOVEMENT (FRENCH) 15
BROWNIAN MOVEMENT 1 AND 2 15
BUBBLE MODEL OF A CRYSTAL--DEFORMATION AND DISLOCATION 29
BUBBLE MODEL OF A CRYSTAL--STRUCTURE AND BOUNDARIES 29
BUILDING ATOM MODELS--ISOMERISM 43
BUOYANCY IN A GAS 53
BUOYANCY IN LIQUIDS 53

C

CAPACITORS AND DIELECTRICS 19
CARNOT CYCLE AND THE KELVIN TEMPERATURE SCALE 15
CATALYSIS 43
CATHODE AND ANODE IN A VACUUM TUBE (GERMAN) 53
CELESTIAL MECHANICS AND THE LUNAR PROBE 41
CENTER-OF-MASS PENDULUM 5
CHAIN REACTÎONS, CONTROLLED AND UNCONTROLLED 29
CHAIN REACTION--CONTROLLED CHAIN REACTION 29
CHANGE OF FREQUENCY 23
CHANGE OF PHASE 23
CHANGES ON MIXING 43
CHARACTERISTIC SURFACE OF FLUIDS (FRENCH) 15
CHARGE DISTRIBUTION--CONCENTRATION AND POINT DISCHARGE 19
CHARGE DISTRIBUTION--THE FARADAY ICE PAIL EXPERIMENT 19
CHARGES IN MOTION--THE FLOW OF CHARGE 19
CHARGES IN MOTION--THE INDUCTION PROCESS 19
CHARLES' LAW 46
CHEMICAL BONDING 43
CIRCULAR WAVE REFLECTION FROM VARIOUS BARRIERS 23
CLASSIFYING PATHS I 49
CLASSIFYING PATHS II 49
COANDA EFFECT 35
COCK WITH MIRROR IMAGE 23
COLLIDING FREIGHT CARS 5
COLLISIONS WITH AN UNKNOWN OBJECT 5
COLOR QUALITY OF LIGHT IN PHOTOGRAPHY 23
COMBUSTION IN ENGINES 53
COMET ORBITS 41
COMPUTER I 41
COMPUTER II--PROGRAM ORBIT 41
COMPUTER ANIMATION EXAMPLES 53
COMPUTER STUDIES OF FLUID DYNAMICS 35
CONCEPT OF SPEED I, THE 5
CONCEPT OF SPEED II, THE 5
CONDENSATION NUCLEI 53
CONFORMAL REPRESENTATION,THE--W = 1/Z 49
CONFORMAL REPRESENTATION,THE--W = Z + 1/Z 49
CONQUEST OF LIGHT, THE 53
CONSERVATION OF ENERGY 5
CONSERVATION OF LINEAR AND ANGULAR MOMENTUM 5
CONSERVATION OF MOMENTUM--ELASTIC COLLISIONS 5
CONSERVATION OF MOMENTUM--INELASTIC COLLISIONS 6
CONSTANT VELOCITY AND UNIFORM ACCELERATION 6
CONSTRUCTION OF THE EXPERIMENTAL BOILING WATER REACTOR 54

CONVECTION OF WATER, THE 15
COPPER SILVER ELECTROCHEMICAL CELL, THE 43
COSINE FUNCTION 49
COULOMB'S LAW--VARIATION OF FORCE WITH CHARGE 19
COULOMB'S LAW--VARIATION OF FORCE WITH DISTANCE 19
COUPLED OSCILLATORS--EQUAL MASSES 6
COUPLED OSCILLATORS--UNEQUAL MASSES 6
CRITICAL SIZE 29
CRITICAL TEMPERATURE 15
CRITICAL TEMPERATURE OF SULFUR DIOXIDE, THE 15
CROOKE'S TUBES 29
CRYOGENIC PUMP 54
CRYSTAL CLEAR 43
CRYSTAL GROWTH OF TUNGSTEN OXIDE 43
CRYSTAL STRUCTURE OF METALS 30
CRYSTALS AND THEIR STRUCTURES 30
CRYSTALS AND X-RAY DIFFRACTION 30
CRYSTALS AT WORK 43
CURRENT INDUCED INSTABILITIES OF A MERCURY JET 35
CUS PUPIL EXPERIMENT 43

D

DAMPED OSCILLATIONS 6
DANCE SQUARED 49
DC DYNAMO 54
DC MOTOR 54
DEFLECTION OF ELECTRONS IN A MAGNETIC FIELD(DANISH) 19
DEFORMATION OF LIQUIDS 35
DEMODULATOR, THE 54
DENSITY 43
DETERMINATION OF VAPOR PRESSURE BY BAROMETER 15
DETONATIONS 35
DIESEL ENGINE, THE--IDEAL DIESEL CYCLE 54
DIFFRACTION AND SCATTERING AROUND OBSTACLES 24
DIFFRACTION AT AN APERTURE 24
DIFFRACTION--DOUBLE SLIT 24
DIFFRACTION OF X-RAYS BY A CRYSTAL 30
DIFFRACTION--SINGLE SLIT 24
DIFFUSION 15
DIFFUSION, PART I 15
DIFFUSION, PART II 15
DIFFUSION PUMP--MERCURY VAPOR 54
DIFFUSION PUMP--OIL VAPOR 54
DISPLACEMENT 6
DISTRIBUTION OF MOLECULAR SPEEDS 15
DOPPLER EFFECT 24
DOPPLER EFFECT 24
DOPPLER EFFECT AND SHOCK WAVES 24
DOT LATTICE, A--PATTERNS OF NUMBERS IN SHAPES 49
DR. BLACK'S OBSERVATIONS ON HEAT 44

E

EARTH'S SHAPE 41
ECLIPSE AT GRAND'MERE 41
ECLIPSE OF THE MOON 41
ECLIPSE OF THE SUN 41
EFFECT OF AXIAL JET ON AFTERBODY SEPARATION 35
EFFECT OF LEAKS 46
EFFECT OF JET BLOWING OVER AIRFOIL FLAP 35
EFFECT OF PHASE DIFFERENCES BETWEEN SOURCES 24
EFFECTS OF INDUCTORS AND CAPACITORS ON AC AND
  POWER FACTOR 20
ELASTOHYDRODYNAMIC LUBRICATION 54
ELASTOID-INERTIA OSCILLATIONS IN A ROTATING FLUID 35
ELECTRICAL QUALITY CONTROL OF RAW MICA USED IN
  CAPACITORS 54
ELECTRIC CHARGE 20
ELECTRIC INTERACTIONS IN CHEMISTRY 44
ELECTRICITY AND HEAT 20
ELECTRIC LINES OF FORCE 20
ELECTROCHEMICAL CELLS 44
ELECTROCHEMICAL CELL-ANIMATED MECHANISM, AN 44
ELECTRODES AND CELL PROCESSES ILLUSTRATED TO SHOW 44
ELECTRODYNAMICS 20
ELECTROLYSIS 44
ELECTROLYSIS OF BRINE, THE 44
ELECTROMAGNETIC INDUCTION 20
ELECTRONEGATIVITY 44
ELECTRONIC BEAM TUBE 54
ELECTRONIC SPECTRA OF 016 AND 018 44
ELECTRONS 30
ELECTRONS IN A UNIFORM MAGNETIC FIELD 30
ELECTROSCOPE, THE (PROD-LEPG) 20
ELECTROSCOPE, THE (PROD-LOEW) 20
ELECTROSTATIC INDUCTION 20
ELECTROSTATICS (PROD-EBF) 20
ELECTROSTATICS (PROD-LEPG) 20
ELEMENTS OF ELECTRICAL CIRCUITS 20
ELLIPSE AS A CONICAL SECTION, THE (GERMAN) 49
E/M DEMONSTRATION 54
EMISSION AND ABSORPTION OF RADIATION, THE 16
ENERGY ABSORPTION PROCESS EMPLOYING FRANGIBLE
  METAL TUBING, THE 54
ENERGY AND ITS TRANSFORMATION 6
ENERGY AND THE PENDULUM 6
ENERGY CONVERSION I--POLE VAULTER 6
ENERGY CONVERSION II--AIRCRAFT TAKE OFF 6
ENERGY TRANSFER 6
ENERGY TRANSFORMATION I 44
ENERGY TRANSFORMATION II 44
ENGINE, THE 54
EQUILIBRIUM 44
EQUIPARTITION OF ENERGY 16
EXAMPLES OF SURFACE TENSION 36
EXAMPLES OF TURBULENT FLOW BETWEEN
  ROTATING CYLINDERS 36
EXPERIMENTAL WEIGHTLESSNESS 6
EXPERIMENT ON THE CONSERVATION OF MOMENTUM, AN 6
EXPLORING THE NIGHT SKY 41
EXPLORING THE UNIVERSE 41
EXPLOSION OF A CLUSTER OF OBJECTS 6
EYES IN SPACE 41

F

FALLING BODIES 6
FAST REACTION--MERCURY AND SILVER NITRATE 44
FERROMAGNETIC DOMAIN WALL MOTION 30
FIELD EMISSION OF ELECTRONS 30
FIELD OF VIEW 24
FINDING THE SPEED OF A RIFLE BULLET--METHOD I 6
FINDING THE SPEED OF A RIFLE BULLET--METHOD II 7
FIRING THE GETTERS 54
FIXED SYSTEM OF ORBITING BODIES 7
FLOTATION IN ACTION 36
FLOW FROM A RESERVOIR TO A DUCT 36
FLOW NEAR TIP OF LIFTING WING 36
FLOW OVER AN UPSTREAM FACING STEP 36
FLOW PATTERNS IN VENTURIS, NOZZLES AND ORIFICES 36
FLOW REGIMES IN SUBSONIC DIFFUSERS 36
FLOW SEPARATION AND VORTEX SHEDDING 36
FLOW THROUGH FANS AND PROPELLERS 36
FLOW THROUGH PORTED CHAMBERS 36
FLOW THROUGH RIGHT-ANGLE BENDS 36
FLOW THROUGH TEE-ELBOW 36
FOCUSING WAVES IN A RIPPLE TANK BY MEANS OF
  FRESNEL DIFFRACTION 24
FORCE ACTS ON A ELECTRIC CHARGE MOVING IN
  A MAGNETIC FIELD, A 20
FORCE, MASS AND ACCELERATION 7
FORCE, MASS, AND MOTION 7
FORE PUMP,THE 54
FORCES 7
FORMATION OF BUBBLES 36
FORMATION OF MIST, THE 16
FORMATION OF SHOCK WAVES 36
FORMULAS IN MATHEMATICS 49
FOURIER ANALYSIS AND SYNTHESIS OF ELECTRON DENSITY
  IN CRYSTALS 30
FOUR TELESCOPE ARRANGEMENTS 24
FRACTURE OF SOLIDS, THE 30
FRAMES OF REFERENCE, PART I 7

FRAMES OF REFERENCE, PART II 7
FRASCH SULPHUR PUMP 54
FREE FALL 7
FREE FALL FROM AN AIRCRAFT 7
FREE FALL IN SPACE 7
FREQUENCY CHANGER, THE 54
FRICTION BRAKE EXPERIMENT, A 54
FUNDAMENTALS OF ACOUSTICS 24
FURTHER EXAMPLES OF ONE-DIMENSIONAL COLLISIONS 7
FURTHER EXAMPLES OF TWO-DIMENSIONAL COLLISIONS 7

G

GALILEAN RELATIVITY I 7
GALILEAN RELATIVITY II 7
GALILEAN RELATIVITY DEMONSTRATED BY PROJECTILE MOTION 7
GALILEO'S LAWS OF FALLING BODIES 7
GASES AND HOW THEY COMBINE 16
GASEOUS DIFFUSION 30
GAS IONIZATION (FRENCH) 20
GAS PRESSURE AND MOLECULAR COLLISIONS 16
GAS REACTION (AMMONIA AND HYDROGEN CHLORIDE) 44
GAS REACTION (HYDROGEN AND OXYGEN) 44
GAS THERMOMETER, THE 16
GASOLINE ENGINE,THE 55
GAUGING THICKNESS WITH RADIOISOTOPES 30
GEIGER AND MARSDEN EXPERIMENT 30
GEIGER COUNTER 30
GENERATION OF CIRCULATION AND LIFT FOR AN AIRFOIL 36
GEOMETRY--CURVES AND CIRCLES 49
GEOMETRY--LINES AND SHAPES 49
GEOMETRY--POINTS, ANGLES, LINES AND TIGERS 49
GRAM-ATOMS
GRAVITATIONAL POTENTIAL ENERGY 7
GRAVITATIONAL SEPARATION 16
GROWTH OF CRYSTALS 30
GROWTH OF ICE FILAMENTS, THE (FRENCH) 44
GROWTH OF SOAP BUBBLES 8
GUINEA AND FEATHER EXPERIMENT, THE 8
GYROSCOPE PRECESSION 8

H

HALF-LIFE 30
HALF-LIFE OF A RADIOACTIVE COIN 30
HARMONIC PHASORS 24
HEAT DISTRIBUTION IN THE SPECTRUM OF A CARBON ARC 16
HEATING WATER 16
HEAT--ITS NATURE AND TRANSFER 16
HEAT TRANSFER AND TWO-PHASE FLUID FLOW STUDIES 16
HEIGHT GAUGES AND TEST INDICATORS 55
HELE-SHAW ANALOG TO POTENTIAL FLOWS, PART I--SOURCES AND SINKS IN UNIFORM FLOW 37
HELE-SHAW ANALOG TO POTENTIAL FLOWS, PART II--SOURCES AND SINKS 37
HIGH ENERGY PEOPLE, THE 30
HIGH FREQUENCY HEATING 20
HIGH HURDLE I 8
HIGH HURDLE II 8
HIGH-SPEED PHOTOGRAPHY IN NUCLEAR REACTOR DEVELOPMENT 30
HIGH TEMPERATURE RESEARCH 44
HOMOGENEOUS NUCLEATION AND THE DIELECTRIC NATURE OF ICE CRYSTALS 55
HOOKE'S LAW AND YOUNG'S MODULUS 55
HORSESHOE VORTEX, THE 37
HOT WATER SYSTEM 55
HOW AN AIR TRACK WORKS 8
HOW DOES THE RADIO WORK 20
HOW A THERMAL REACTOR WORKS 31
HYDRAULIC LIFT, PART I 55
HYDRAULIC LIFT, PART II 55
HYDROGEN ATOM AS VIEWED BY QUANTUM MECHANICS--ADVANCED VERSION, THE 31
HYDROGEN ATOM AS VIEWED BY QUANTUM MECHANICS--STANDARD VERSION, THE 31
HYDROGEN GENERATOR--MARSH TEST 44
HYDROGEN LIGHT 56
HYPOCYCLIC MOTION 55

I

IMMEDIATE FIELD 20
INCOMPRESSIBLE FLOW THROUGH AREA CONTRACTIONS AND EXPANSIONS 37
INDEPENDENCE OF HORIZONTAL AND VERTICAL MOTIONS 8
INDUCTION (DANISH) 21
INDUCTORS 21
INERTIAL FORCES--CENTRIPETAL ACCELERATION 8
INERTIAL FORCES--TRANSLATIONAL ACCELERATION 8
INFLUENCE OF A SINGLE-MOLECULE FILM ON MOVEMENT OF THE SUPPORTING LIQUID (FRENCH) 37
INFRARED RADIATION 16
INFRARED SPECTRA AND MOLECULAR STRUCTURE 44
INSTABILITIES IN CIRCULAR COUETTE FLOW 37
INSTANTANEOUS SPEED I 8
INSTANTANEOUS SPEED II 8
INSTANTANEOUS SPEED III 8
INSULATORS AND CONDUCTORS 21
INTERACTION BETWEEN OBLIQUE SHOCKS AND EXPANSION WAVES 37
INTERACTION OF OBLIQUE SHOCK WITH FLAT PLATE BOUNDARY LAYER 37
INTERFERENCE 24
INTERFERENCE 24
INTERFERENCE AND DIFFRACTION--RIPPLE TANK WAVE PHENOMENA II 24
INTERFERENCE OF WAVES 24
INTERPRETATION OF VIBRATION SPECTRA 45
INTERSECTION OF SURFACES 49
INTRODUCING GLOBES 41
INTRODUCTION TO ELECTROSTATICS 21
INTRODUCTION TO JET ENGINES, AN 55
INTRODUCTION TO REACTION KINETICS 45
INVERSES AND IDENTITIES (NUMBERS) 49
INVERSES AND IDENTITIES (PATHS) 49
INVERSION OF IMAGE IN BULL'S EYE 25
IONIZATION ENERGY 31
IONIZATION ENERGIES 45
IONIZATION OF GASES (FRENCH) 45
ION PUMP 55
ION REMOVAL BY METATHESIS 45

J

JUPITER, SATURN AND MARS IN MOTION 41

K

KEPLER'S LAW 42
KINETIC ENERGY OF MOTION 8
KINETIC-MOLECULAR THEORY 16

L

LASER BEAM, THE 55
LAWS OF CONSERVATION OF ENERGY AND MATTER 8
LAWS OF SLIDING FRICTION 8

LEAD BROMIDE ELECTROLYSIS 45
LEADING EDGE SEPARATION BUBBLE IN TWO-DIMENSIONAL FLOW 37
LEADING-EDGE VORTICES ON DELTA WING IN SUBSONIC FLOW 37
LE CHATELIER'S PRINCIPLE 45
LENSES 25
LENZ LAW I 21
LENZ LAW II 21
LESLIE'S CUBE 16
LIFT PUMP, THE 55
LIGHT AND ELECTRONS 31
LIGHT AND PARTICLES I 25
LIGHT AND PARTICLES II 25
LIGHT PATH THEOREM, THE 25
LIGHT WAVES AND THEIR USES 25
LIGHT, X-RAYS, GAMMA RAYS 25
LINEAR UNIFORM MOTION 8
LIQUID/GAS EQUILIBRIUM 45
LIQUID-LIQUID DISPERSIONS 45
LONGITUDINAL NATURE OF SOUND WAVES 25
LONGITUDINAL WAVES (PROD-GATE) 25
LONGITUDINAL WAVES (PROD-TECH) 25
LONGITUDINAL WAVE WITH DISPLACEMENT FUNCTION 25
LONGITUDINAL WAVE WITH PRESSURE FUNCTION 25
LORD RUTHERFORD ON ''THE ATOM'' 31

M

MAGNETIC BOTTLE, THE 31
MAGNETIC FIELD (DANISH) 21
MAGNETIC FIELD SPARK CHAMBER STUDIES 21
MAGNUS EFFECT, THE 37
MAKING AN ANODE STRUCTURE 55
MARS AND JUPITER 42
MASS SPECTROMETRIC DETERMINATION OF MASS AND RELATIVE ABUNDANCES OF ISOTOPES OF AN ELEMENT 45
MATTER OF RELATIVE MOTION, A 8
MAXWELL BOLTZMAN DISTRIBUTION OF VELOCITIES 16
MAXWELL SPEED DISTRIBUTION 16
MEANING OF PRESSURE, THE 16
MEASUREMENT OF G--CAVENDISH EXPERIMENT 8
MEASUREMENT OF THE ACCELERATION OF GRAVITY--FALLING BODY, A 9
MEASUREMENT OF THE SPEED OF A RIFLE BULLET, A 9
MEASUREMENT OF THE SPEED OF LIGHT 25
MEASUREMENT OF TIME I 9
MEASUREMENT OF TIME II 9
MEASUREMENT OF TIME III, THE 9
MEASUREMENT OF VERY HIGH SPEEDS 9
MEASURING THE HALF-LIFE OF IODINE-128 31
MEASURING THE SPEED OF LIGHT 25
MEASURING THE VERY SMALL 55
MECHANICAL EQUIVALENT OF HEAT, THE 17
MECHANICAL PUMPS--FORE PUMPS 55
MECHANICAL PUMPS--MOLECULAR PUMPS 55
MECHANISM OF CHROMATOGRAPHIC SEPARATION 45
MELTING POINTS (RELATION TO PERIOD TABLE) 45
METALS AND NON-METALS 45
METALS--MECHANICAL PROPERTIES 55
MICHAEL FARADAY 55
MICHELSON INTERFEROMETER 25
MICROMETER (METRIC), THE 55
MICROMETER (METRIC), THE PRACTICAL EXAMPLES 55
MICROWAVES 25
MILLIKAN'S OIL DROP EXPERIMENT 31
MILLION TO ONE, A 9
MISSILE NAMED MAC, A 56
MODEL OF A MAGNET 21
MODELS OF REFLECTION AND REFRACTION 25
MOLECULAR MOTIONS 31
MOLECULAR SPECTROSCOPY 31
MOLECULAR THEORY OF MATTER 45
MOLECULAR VIBRATIONS USING MODELS 45
MOLECULAR WEIGHT OF SOLUTES 45
MOLECULES 45
MOMENTUM AND THE PENDULUM 9
MOMENTUM OF ELECTRONS 9
MOTION AT RIGHT ANGLES 9
MOTION IN A CIRCLE, PART I 9
MOTION IN A CIRCLE, PART II 9
MOTIONS CAUSED BY COMPOSITION GRADIENTS ALONG LIQUID SURFACES 37
MOTIONS CAUSED BY ELECTRICAL AND CHEMICAL EFFECTS ON LIQUID SURFACES 37
MOTIONS CAUSED BY TEMPERATURE GRADIENTS ALONG LIQUID SURFACES 37
MOTOR EFFECT, THE 21
MOVEMENT IN CRYSTAL GROWTH 45
MOVEMENT OF MOLECULES 45
MOVEMENT OF TWO SOURCES 25
MOVING SYSTEM OF ORBITING BODIES 9
MULTIPLE SLIT DIFFRACTION 26
MUTUAL INDUCTION 21

N

NEUTRON ACTIVATION 31
NEUTRON DIFFRACTION 31
NEUTRON IMAGE DETECTOR 56
NEWTON'S EQUAL AREAS 9
NEWTON'S FIRST AND SECOND LAWS 9
NEWTON'S LAW OF MOTION 9
NEWTON'S SATELLITE 10
NEWTON'S SECOND LAW OF MOTION 10
NEWTON'S THIRD LAW 10
NONRECURRENT WAVEFRONTS 26
NORMAL MODES 10
NUCLEAR RADIATION DETECTORS, PART I 31
NUCLEAR RADIATION DETECTORS, PART II 31
NUCLEAR RADIATION DETECTORS, PART III 31
NUCLEAR REACTOR, THE 56
NUCLEAR REACTOR SPACE POWER SYSTEMS 56
NUCLEAR SHIP SAVANNAH, THE 56
NUCLEATION OF SUPERCOOLED CLOUDS 56

O

OCCURRENCE OF TURBULENCE, THE 37
OHM'S LAW 21
ONE-DIMENSIONAL COLLISIONS 10
ONE-DIMENSIONAL MOTION 10
OPERATION OF THE B. AND L. SPECTRONIC 20 56
OPERATION OF THE BECKMAN IR-8 SPECTROPHOTOMETER 56
OPERATION OF THE METTLER BALANCE 46
OPERATION OF THE VAPOR CHROMATOGRAPH 56
OPPOSITE VELOCITIES AND DIFFERENT FREQUENCIES 26
OPTICAL COMMUNICATIONS DEVICE 56
ORBIT GRAPHING BY ITERATION 42
ORBITING BODIES IN VARIOUS FORCE FIELDS, PART I 10
ORBITING BODIES IN VARIOUS FORCE FIELDS, PART II 10
ORBIT OF JUPITER SATELLITE 42
OSCILLATOR, THE 56
OSCILLOSCOPE, THE--WHAT IT IS, WHAT IT DOES 56
OTHER OSCILLATORS 10
OUR SUN IN ACTION I--PROMINENCE MOVIES IN 56
OUR SUN IN ACTION II--SOLAR CORONA 56
OUR SUN IN ACTION III--LARGE SCALE 56

P

PARABOLA AS A CONICAL SECTION, THE (GERMAN) 49
PARALLEL WIRE CURRENT BALANCE, A 21
PARAMAGNETISM OF LIQUID OXYGEN 31
PARTIAL STANDING WAVE 26

PARTICLES 26
PASCAL'S TRIANGLE 49
PASSAGE OF A SHOCK WAVE THROUGH A CIRCULAR ORIFICE 38
PATHLINES, STREAKLINES, AND STREAMLINES IN STEADY FLOW 38
PATHLINES, STREAKLINES, STREAMLINES, AND TIMELINES IN UNSTEADY FLOW 38
PENDULA--FORCED DAMPED HARMONIC OSCILLATORS 10
PERFECTLY INELASTIC ONE-DIMENSIONAL COLLISIONS 10
PERFECTLY INELASTIC TWO-DIMENSIONAL COLLISIONS 10
PHASE CHANGE 17
PHASE DEMONSTRATION 17
PHASE DIAGRAM OF AN ALLOY 17
PHOTO-ELECTRIC CELLS 56
PHOTOELECTRIC EFFECT 32
PHOTOELECTRIC EFFECT 32
PHOTOELECTRIC EFFECT, THE 21
PHOTO-ELECTRICITY 32
PHOTO EMISSION OF ELECTRONS 32
PHYSICS FOR ALL 56
PINHOLE CAMERA 26
PLANE AND SPHERICAL WAVES--DIFFRACTION AT OBSTACLES 26
PLANETS IN ORBIT--THE LAWS OF KEPLER 42
PLASTICS 46
PLUCKED STRINGS 26
POLARIZATION INTERFEROMETRY APPLIED TO INVESTIGATING SOME PHENOMENA LINKED WITH SURFACE TENSION 46
POLYMER SCIENCE 46
POWER SUPPLY UNIT, THE 56
PRECESSION CAMERA GEOMETRY 32
PRECISION COMMAND GUIDANCE FOR BALLISTIC MISSLES 56
PRECISION IN VOLUME MEASUREMENT 46
PREPARING A DIODE HEADER 57
PREPARING AND BAKING A SOLDER GLASS SEAL 57
PREPARING THE GETTER HEADER 57
PRESSURE 2--SIMPLE KINETIC THEORY 17
PRESSURE 3--SUCTION CUP 57
PRESSURE 4--COLLAPSING CAN 57
PRESSURE 5--MAGDEBURG HEMISPHERES 57
PRIMARY CELL, THE 46
PRINCIPLES OF NUCLEAR FISSION 32
PRINCIPLES OF THE GYROSCOPE 10
PRINCIPLES OF THERMAL, FAST AND BREEDER REACTORS 32
PROBLEM IN DIFFRACTION, A 26
PROBLEMS IN ELECTROSTATICS 21
PROGRAMMING LANGUAGES 49
PROGRESSIVE WAVES--TRANSVERSE AND LONGITUDINAL 26
PROJECT DUGOUT 57
PROJECT SEDAN 57
PROJECTILES 10
PROMINENCE MOVIES 56
PROPAGATING STALL IN CASCADES 38
PROPANE BUBBLE CHAMBERS 57
PROPERTIES OF A COVALENTLY BONDED MOLECULE, THE 46
PROPERTIES OF AN IONIC COMPOUND 46
PROPERTIES OF GAS 17
PROPERTIES OF MIXTURES AND COMPOUNDS 46
PROTON MOTIONS IN ICE 46
PULSES 10
PUNCHED CARDS, TRUTH TABLES AND SWITCHES 57
PUTTING FREE ELECTRONS TO WORK 21
PYTHAGORAS 50
PYTHAGOREAN THEOREM--THE COSINE FORMULA 50
PYTHAGOREAN THEOREM--PROOF BY AREA 50

Q

QUANTUM MECHANICAL HARMONIC OSCILLATOR 32

R

RADAR 57
RADIAL FLOW BETWEEN PARALLEL DISCS 38
RADIOACTIVE DECAY 32
RADIOACTIVE MATERIALS 32
RADIOACTIVITY 1 32
RADIOACTIVITY 2 32
RADIOACTIVITY 3 32
RADIOACTIVITY 4 32
RADIOACTIVITY 5 32
RADIUM 32
RANDOM MOTION 17
RANDOM WALK AND BROWNIAN MOTION 17
RANGER VII PHOTOGRAPHS OF THE MOON 42
RATE OF COMBUSTION 46
RECOIL 11
RECEIVER, THE 57
RECTILINEAR PROPAGATION 26
REFLECTED LIGHT--GLASS IN LIQUIDS 26
REFLECTION AT PLANE AND CURVED SURFACES 26
REFLECTION OF RADIATION, THE 17
REFLECTION OF WAVES FROM CONCAVE BARRIERS 26
REFLECTION PROPERTY OF THE ELLIPSE, THE 50
REFRACTION (PROD-HB) 26
REFRACTION (PROD-UWF) 26
REFRACTION OF LIGHT 27
REFRACTION OF WAVES 27
REGELATION (PROD-NOR) 17
REGELATION (PROD-TECH) 17
REPULSION MOTOR PRINCIPLES 57
RESEARCH PROBLEM--INERT GAS COMPOUNDS, A 46
RESOLVING POWER 27
RESONANCE 11
RETROGRADE MOTION OF A PLANET--CURRENT MODEL 42
RETROGRADE MOTION OF A PLANET--PTOLEMAIC MODEL 42
RING OF COUPLED PENDULA I--NORMAL MODES 11
RING OF COUPLED PENDULA II--MIXTURES OF NORMAL MODES 11
ROTATING REFERENCE FRAMES 11
ROTATIONAL DYNAMICS--KINETIC ENERGY 11
RUTHERFORD-ROYD'S IDENTIFICATION OF ALPHA PARTICLES IN HELIUM 32
RUTHERFORD SCATTERING 32

S

SAND PENDULUM I--POINT SUSPENSION 11
SAND PENDULUM II--SADDLE SUSPENSION 11
SAND PENDULUM III--SHORT SADDLE SUSPENSION 11
SAND PENDULUM IV--MULTIPLE SADDLE SUSPENSION 11
SCATTERING IN ONE DIMENSION--PART I - BARRIERS 33
SCATTERING IN ONE DIMENSION--PART II - SQUARE WELLS 33
SCATTERING IN ONE DIMENSION--PART III - POTENTIAL WELLS 33
SCATTERING IN ONE DIMENSION--PART IV - MOMENTUM AND X-SPACE 33
SCATTERING OF A CLUSTER OF OBJECTS 11
SCATTERING OF QUANTUM MECHANICAL WAVE PACKETS FROM POTENTIAL WELL AND BARRIER 33
SCIENTIFIC METHOD IN ACTION 57
SCINTILLATION SPECTROMETRY 33
SEALING-OFF THE SMALL HEADER TUBES
SECONDARY CELL, THE 46
SECONDARY FLOW IN A BEND 38
SEPARATED FLOWS--PART I 38
SEPARATED FLOWS--PART II 38
SERIES AND PARALLEL CIRCUITS 21
SETTING UP THE BALANCE 57
SHADOWS AND ECLIPSES 42
SHAPE OF LIQUID DROPS 11
SHAPES AND POLARITIES OF MOLECULES 46
SHEAR DEFORMATION OF VISCOUS FLUIDS 38
SHOCK AND BOUNDARY LAYER INTERACTION ON TRANSONIC AIRFOIL 38
SIGNAL GENERATOR OPERATION 57
SILVER-HYDROGEN ELECTROCHEMICAL CELL, A 46
SIMPLE HARMONIC MOTION (PROD-AP) 11
SIMPLE HARMONIC MOTION (PROD-HEIL) 27
SIMPLE HARMONIC MOTION (PROD-TECH) 50
SIMPLE HARMONIC MOTION--THE STRINGLESS PENDULUM 11
SIMULTANEITY 11
SIMULATION OF A TWO-GYRO GRAVITY-GRADIENT ATTITUDE CONTROL SYSTEM 42
SINE FUNCTION 50
SINE WAVE, THE 50

SINGLE PAN SARTURIUS BALANCE, THE 46
SINGLE SLIT DIFFRACTION 27
SINK VORTEX, THE 38
SLIDE RULE, THE--CI SCALE 50
SLIDE RULE, THE--DIVISION, C AND D SCALES 50
SLIDE RULE, THE--MULTIPLICATION, C AND D SCALES 50
SLIDE RULE, THE--READING AND HANDLING 50
SLIDE RULE, THE--SQUARES, CUBES, AND ROOTS 50
SLIDE RULE, THE--TWO-DIGIT PRACTICE 50
SLIDE RULE, THE--THREE-DIGIT PRACTICE 50
SLIDE RULE, THE--WHY IT WORKS 50
SLOT BLOWING TO SUPPRESS SHOCK-INDUCED SEPARATION 38
SLOW REACTION--IRON AND OXYGEN 46
SMALL AMPLITUDE WAVES 38
SMALL TURBINES WITH AIR BEARINGS (FRENCH) 57
SNAP-8--SYSTEM FOR NUCLEAR AUXILIARY POWER 57
SOAP FILM OSCILLATIONS 11
SOLAR CHROMOSPHERE, THE 57
SOLAR FLARES 42
SOLAR PROMINENCES 42
SOLDER GLASS TECHNIQUE 58
SOLID/LIQUID EQUILIBRIUM 46
SOLUTION, EVAPORATION, AND CRYSTALLIZATION 47
SOLUTIONS 47
SOME REGIMES OF BOUNDARY LAYER TRANSITION 38
SOUND WAVES AND THEIR SOURCES 27
SOURCE MOVING AT SPEEDS BELOW AND ABOVE WAVE SPEEDS 38
SPECTRUM OF THE HYDROGEN ATOM, THE 33
SPEED OF A PULSE IN A STRETCHED ROPE, THE 27
SPHERICAL MIRRORS 27
STAGNATION PRESSURE 39
STANDING WAVE 27
STATIC ELECTRICITY (DANISH) 22
STATIC ELECTRICITY--INDUCTION 22
STATIONARY LONGITUDINAL WAVES 27
STATIONARY TRANSVERSE WAVES 27
STRAIGHT WAVE REFLECTION FROM STRAIGHT BARRIERS 27
STREAMLINE CURVATURE AND NORMAL PRESSURE GRADIENT 39
STREAMWISE PRESSURE GRADIENT IN INVISCID FLOW 39
STRING PROPERTY OF THE ELLIPSE, THE 50
STROBE PHOTOS 58
STROBOSCOPIC PHOTOGRAPHY AS A MEANS OF MEASURING SPEED 12
STRUCTURE OF A COVALENT MOLECULE C-CL4 47
STRUCTURE OF AN IONIC CRYSTAL, THE 47
STRUCTURE OF THE TURBULENT BOUNDARY LAYER 39
SULPHUR CRYSTALS 47
SULFUR, ITS PHYSICAL STATES AND PROPERTIES 47
SUM OF IDENTICAL WAVES NOT IN PHASE AGREEMENT 27
SUM OF TWO IDENTICAL WAVES 27
SUM OF TWO WAVES OF DIFFERENT FREQUENCY 27
SUPERPOSITION 27
SUPERPOSITION OF PULSES 27
SUPERSONIC CONICAL-SPIKE INLET 39
SUPERSONIC FLOW PAST DIAMOND AIRFOIL 39
SUPERSONIC ZONES ON AIRFOILS IN SUBSONIC FLOW 39
SURFACE OXIDATION IN COPPER 47
SURFACE TENSION AND CONTACT ANGLES 39
SURFACE TENSION AND CURVED SURFACES 39
SURFACE TENSION IN FLUID MECHANICS 39
SYPHON, THE 58

T

TACOMA NARROWS BRIDGE COLLAPSE 12
TANGENCY 51
TANGENT FUNCTION 51
TECHNIQUES OF VISUALIZATION FOR LOW SPEED FLOWS--PART I 39
TECHNIQUES OF VISUALIZATION FOR LOW SPEED FLOWS--PART II 39
TELEPHOTO LENS, THE 28
TELEVISION RECEIVERS 58
TEMPERATURE AND THE BOLTZMANN DISTRIBUTION 17
TEMPERATURE WAVES 17
TESTING FOR LEAKS AND OUTGASSING 58
THERMIONIC EMISSION OF ELECTRONS 22
THERMODYNAMICS 17
THIN BODIES OF REVOLUTION AT INCIDENCE 39
THIN LAYER CHROMATOGRAPHY 47
THOMSON'S POSITIVE RAY PARABOLAS 33
THREE DIMENSIONAL BOUNDARY-LAYER SEPARATION 39
TIME DILATION--AN EXPERIMENT WITH MU-MESONS 12
TIME REVERSAL 58
TOLLMIEN-SCHLICHTING WAVES 39
TOMORROW'S POWER--TODAY 58
TORNADOES IN NATURE AND THE LABORATORY 40
TRANSFER AND DISTRIBUTION OF CHARGE 22
TRANSFORMATION GEOMETRY SERIES 51
TRANSFORMER, THE 58
TRANSISTOR, THE 58
TRANSISTORS--HIGH-FREQUENCY OPERATIONS--AMPLIFIERS AND OSCILLATORS 22
TRANSISTORS--MINORITY CARRIERS 22
TRANSITION FROM LAMINAR TO TURBULENT FLOW 40
TRANSMITTER, THE 58
TRANSONIC FLOW PAST A SYMMETRIC AIRFOIL 40
TRANSURANIUM ELEMENTS 47
TRANSVERSE WAVES (PROD-GATE) 28
TRANSVERSE WAVES (PROD-TECH) 28
TRANSVERSE WAVES, SAME FREQUENCY 28
TRANSVERSE WAVES, SAME VELOCITY 28
TRIPLE POINT OF H2O, THE 17
TUNED AMPLIFIER, THE 58
TWO-DIMENSIONAL COLLISIONS 12
TWO EXPERIMENTS WITH IMAGES 28
200-INCH TELESCOPE AT MOUNT PALOMAR, THE 42
TWO PARADOXES 58
TWO SOURCES IN PHASE 28
TYNDALL'S APPARATUS 18
TYPES OF MOTION 12

U

ULTIMATE SPEED, THE--AN EXPLORATION WITH HIGH ENERGY ELECTRONS 33
ULTRASONIC THERMOMETER, THE 18
UNIFORM ACCELERATION 12
UNIFORM CIRCULAR MOTION 12
UNIFORM LINEAR VELOCITY 12
UNIFORMLY ACCELERATED MOTION 12
USE OF WESTMINSTER ELECTROMAGNETIC KIT 58
USING THE BALANCE 58
U-238 RADIOACTIVE SERIES 33

V

VACUUM TUBE IN RADIO 22
VACUUM DISTILLATION 58
VALLECITOS BOILING WATER REACTOR 58
VAN DE GRAAFF GENERATOR, THE 58
VAPOR PRESSURE 47
VAPOR PRESSURE AND BOILING 18
VAPOR PRESSURE AND TEMPERATURE 18
VECTOR ADDITION I 12
VECTOR ADDITION II 12
VELOCITIES NEAR AN AIRFOIL 40
VELOCITY AND ACCELERATION IN CIRCULAR MOTION 12
VELOCITY AND ACCELERATION IN FREE FALL 12
VELOCITY AND ACCELERATION IN SIMPLE HARMONIC MOTION 12
VELOCITY, FREQUENCY AND WAVELENGTH 28
VELOCITY IN CIRCULAR AND SIMPLE HARMONIC MOTION 12
VELOCITY VECTOR, THE 13
VENTURI PASSAGE 40
VERNIER AND MICROMETER SCALES 58
VERNIER EXAMPLES 58
VERNIER SCALE, THE 59
VERY FAST REACTION--AMMONIUM DICTROMATE 47
VIBRATING LIQUID SURFACES AS GENERATORS OF BUBBLES AND DROPS 40
VIBRATION OF MOLECULES 47
VIBRATION OF THE RAIL JOINT (CZECHOSLOVAKIAN) 59
VIBRATIONS (FRENCH) 28
VIBRATIONS OF A DRUM 28
VIBRATIONS OF A METAL PLATE 28

VIBRATIONS OF A RUBBER HOSE 28
VISUALIZATION OF VORTICITY WITH VORTICITY METER--PART I 40
VISUALIZATION OF VORTICITY WITH VORTICITY METER--PART II 40
VOLUME 47
VOLUME CHANGES ON MIXING LIQUIDS I 47
VOLUME CHANGES ON MIXING LIQUIDS II 47
VOLUMETRIC MEASUREMENTS 47

W

WATER ASPIRATOR 47
WAVE EQUATION, A 28
WAVE MACHINE, A 28
WAVE MOTION 28
WAVE NUMBER SPACE I--CONSTRUCTION OF THE WAVE NUMBER VECTOR 33
WAVE NUMBER SPACE II--THE CONSTRUCTION OF BRILLOUIN ZONES 33
WAVES IN A STRING 28
WEIGHING PROCEDURE 47
WEIGHING THE ELECTRON 33
WEIGHING--TRIPLE BEAM BALANCE 47
WHAT ARE STARS MADE OF 42
WHAT IS ELECTRICITY (DANISH) 22
WIDE-ANGLE DIFFUSER WITH SUCTION 40
WILBERFORCE PENDULUM, THE 13
WINDING AN ELECTRIC MOTOR 59
WING-TIP VORTEX 40

X, Y, Z

XENON TETRAFLUORIDE 47
X-15--MAN INTO SPACE 42
ZERO POWER REACTOR III 59